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WEST VIRGINIA UNIVERSITY  
AGRICULTURAL EXPERIMENT STATION,  
MORGANTOWN, W. VA.

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DECEMBER 31, 1902.

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# Commercial Fertilizers.

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## COMPLETE REPORT FOR 1902.

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By J. H. STEWART and B. H. HITE.

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[The Bulletins and Reports of this Station will be mailed free to any citizen of West Virginia upon written application. Address, Director of Agricultural Experiment Station. Morgantown, W. Va.]

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# Complete Report on Commercial Fertilizers for 1902.

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During the past year 294 brands of commercial fertilizers were registered for sale in this State. This greatly exceeds the number registered in any previous year. The reason for such an increase is not hard to find. It is due almost entirely to the removal of the \$10.00 to \$30.00 registration fee. Under the old law the manufacturers considered well the proposition to incur the expense of registering a brand for which they did not already have an established trade, and the case was even worse for firms beginning business in the State. By cutting down the registration fee to the nominal sum of \$1.00, all brands and all manufacturers are put on the same footing, and many brands heretofore unknown to the State are at the disposal of the farmers, who can the better meet the requirements of their soils and crops, while the competition of the firms heretofore excluded from the State has accomplished the usual result: fertilizers are sold on closer margins than ever before.

By putting all brands on the same footing the present law has encouraged the introduction of complete fertilizers and the higher class goods, or rather it has removed the reason for dealing so largely in fertilizers containing but one or two constituents, as shown by the following table, showing the proportion of the various classes of goods registered and sold during 1901 and 1902, in which connection it should be observed that the present law was in force for more than half of the year 1901:

| Class.   | 1901.                     |                   | 1902.                   |                   |
|--|---------------------------|-------------------|-------------------------|-------------------|
|  | Per c't Brands Registered | Per c't Tons Sold | Per c't Brands Regist'd | Per c't Tons Sold |
| Complete fertilizers, . . . . .                      | 48                        | 31                | 52                      | 34                |
| Acid Phosphates, . . . . .                           | 25                        | 46                | 21                      | 39                |
| Acid Phosphates, with Potash, (bone and potash.      | 18                        | 18                | 18                      | 23                |
| Bones, Dissolved Bones, and miscellaneous, . . . . . | 9                         | 5                 | 9                       | 4                 |

This report has to do with the first full year's work under the New Fertilizer Law. The additional requirements of the new law greatly increase the work of this department, but there is a good deal of satisfaction in knowing that every stroke of the work is necessary and valuable to all parties interested in fertilizers and that the law will be fully abreast of the times for many a year to come, for it provides the purchaser at the time the purchase is made, with all the information necessary to enable him to purchase and use any kind of a fertilizer to the very best advantage.

The distinctive feature of this new law is the provision in regard to the materials from which the various constituents of the fertilizers are derived. This has come in for its full share of attention at the hands of manufacturer's doing business in the State, and to their credit it should be said that with few exceptions there has been little or no fault to find with it.

Some manufacturers have contended that to compel them to state under oath what they used in compounding their fertilizers was an encroachment on their privilege to use what they please, but the law does not say they shall use anything. It simply says that if they do use anything they shall state what they use, and use what they state, and that certainly ought to be fair enough. They can use "rough on rats" if they care to do so, but if they use it they must say they use it and having said they use it, it must appear in the goods. This office is at a loss to understand

why a manufacturer should shy at stating what he intends to use (if, as a matter of fact he intends to use it), unless he thinks he might otherwise palm the thing off for something better. In this matter there are just two points, and they both fall well within the only just ground for a fertilizer law or fertilizer control; to-wit: that the purchaser should have some way of judging as to the value of what he is purchasing. When one buys a cooking stove, or a rocking chair, or a hobby-horse, or almost any other thing that might be mentioned, his eyes are his market, but this is not the case with fertilizers. No one can tell by looking at them whether they are what he wants; in fact, they may be just what he does not want. So, in the case of fertilizers it has been customary for a good while to require that statements made by manufacturers as to the composition of their fertilizers shall be in accord with the facts. The fairness of such requirements has long since ceased to be a matter of dispute, but this new law goes a step further and demands that the manufacturer shall disclose certain facts in regard to the composition of his fertilizers, whether he wishes to do so or not. He must state the materials used to furnish any constituent claimed and it is just here that the few objections referred to have come in.

It has been urged that such a requirement is simply an attempt to "meddle with the trade formulas, etc." of the manufacturer, but this office holds that about so much of such "meddling" is necessary for those who would purchase and use fertilizers intelligently. In this connection it should be observed, however, that the great majority of the manufacturers doing business in the State do not seem to regard it as meddling, while many of them seem rather pleased with such an opportunity to disclose the superiority of their goods, and to show that such matters upon which a fair estimate of their wares must so largely depend, are being so carefully considered in this State.

But the objection that has been most earnestly urged is of an altogether different character, and has to do with what a

goodly number of manufacturers seem to regard as their "privilege" to use any material that might be "convenient" to supply the requisite amount of any particular constituent, so long as they use only such materials as, in their judgment, might be termed "high-grade." They contend that to state in advance what materials they will use is asking more than any manufacturer could honestly state, as no one could tell so far in advance, just what he might have to use; that he might state the materials he had on hand or was expecting to use, but that he might "run out" of these and be compelled to use something else, etc., etc. Now, if this office imagined for a moment that such statements define the status of the fertilizer business in this country, some paragraphs would follow that have not been included in this report, although such statements have been made by representatives of concerns doing no small part of the fertilizer business in this State.

Purchasers of Commercial Fertilizers certainly believe that the brand name stands for something. Manufacturers and agents have certainly never overworked themselves in an endeavor to upset such a belief. Why give a thing a name if it possesses nothing to distinguish it from anything else? In finding fault with the law (as above mentioned) for "meddling with trade secrets," it is implied that the various brands possess characteristics of value, but when the same manufacturers insist upon the "privilege" of using anything they may find "convenient" in compounding such "brands," it would seem that the only "trade secret" likely to suffer is the deception of such a practice. The "trade secrets" really worth "meddling with" are usually found in big letters on the bags.

One other objection often urged against the requirement in question is, that it can do no one any good, as the farmers do not understand the differences or "refinements" in composition it is calculated to disclose. It must be admitted that there are yet many farmers who do not understand such matters; but it is



quite probable that the number in this State is by no means as large as some have supposed. This office has never missed an opportunity in its correspondence, bulletins or addresses at farmers' meetings, to awaken an interest in these subjects, believing as it has and does that the greatest source of loss to both makers and users of fertilizers is the failure on the part of both to appreciate the importance of just such "refinements." The manufacturer who wants to stay in the business wants his fertilizers to be used to the best possible advantage, and how on earth can this be done if the user is to ignore or be kept in ignorance of the information without which the fertilizer may even be worse than no fertilizer at all. This office claims that without the information found on the tags required by the present law, no one can purchase or use a fertilizer to the best advantage. Of course a purchaser might be able to obtain the same information some other way, but even then he would be none the worse off for having it before him at the time of the purchase, in the form of a sworn statement. The purchaser might have learned by actual trial that a particular brand was what he needed for a particular crop, on a particular soil, for a particular kind of a season, but suppose that when he ordered the same brand the next year the manufacturer had "run out" of the materials used the year before and so had found it "convenient" to substitute something else. The law requires that as often as the composition of a brand is changed the manufacturer shall make a corresponding change in his affidavit, so that the purchaser may be advised of the change by the tags at the time the purchase is made.

It is to be observed that the manufacturer does not have to state what he intends to use so very long in advance; as a matter of fact the majority of his statements have to do with fertilizers that have been made and drying for weeks or even months. The manufacturer can file his affidavit any time in the year he pleases so he really does not need to make any statements in advance. The thing to which he really objects, is being compelled to keep his brands constant, or admit that they are not constant. In

other words, the law either deprives him of the "privilege" of using anything that happens to be "convenient" in compounding a "brand" or compels him to admit that the brand name means nothing at all.

It should be needless to add that the above remarks apply only to those manufacturers who have claimed that the requirement in question is a hardship, and whose agents (more particularly their general agents), have been running about through the State trying to break the confidence of purchasers in what is unquestionably the best fertilizer law in the United States. They talk about the awful tag tax and the inconvenience and expense of attaching the tags, etc. Now, this little matter of manufacturers making a fuss about maintaining a fertilizer inspection (which, as they always claim, only discloses the great superiority of their goods), is as old as the oldest fertilizer law and has been worked just as long as just as often as the laws have stood in the way of their "privilege" to cheat the purchaser. If any one will but take the time to look into the history of fertilizer legislation, he will find that a law that is really calculated to protect the purchaser invariably carries with it an odious and burdensome tag (or other) tax, and many additional inconveniences and expenses, although the manufacturer making such objections always claims to be most heartily in favor of the inspection, if only it could be done in any other way than the one adopted. As for the inconvenience and expense of attaching tags, it can only be said that it doubtless is inconvenient and expensive to attach a sworn statement that would disclose a deception which but for the tag might be worked at a profit, also at the expense of the farmers, and of the manufacturers who cannot see their way clear to profit by such deceptions.

Such manufacturers in their correspondence and their general agents, in their preaching, are always careful to state very adroitly that the matter of expense is nothing to them, as the

farmer pays it in the end, but since when did they awaken to such a lively interest in the farmer? It has not been so long but that some of us can remember when some of these same firms sold fertilizers worth \$11.00 for \$20.00 a ton and their agents not being satisfied with this, diluted the stuff with more than half its weight of coal ashes, or whatever happened to be “convenient,” but those were the good old days when there was no fertilizer law in this State, and consequently no reason for the excuses which have so little to do with the real reasons for finding fault with the present law. Isn’t it just a little strange that such a lively interest in the agents and farmers should be coincident with the first year’s enforcement of the New Fertilizer Law in this State. The facts in the case are simply as follows: this State was slow in enacting a fertilizer law and for a long time was a “convenient” dumping ground for anything that could not be dumped elsewhere. When at last it did pass a fertilizer law it adopted what were regarded as the best features of the laws then in existence in other States. These laws recognized only the *amount* of the various constituents claimed, regardless of their quality and so did the old law in this State. Any law that has to do with the “privileges” of a certain class of manufacturers is sure to come in for its share of objections, and even our old law was no exception. But in time manufacturers of the class referred to discovered that in a law devoted to the *amount* of the various constituents, regardless of the *quality*, there was an opportunity that measured right up to their standard, in that they could use any sort of cheap materials to provide the requisite amount of the various constituents and be reported “up to guarantee” right along with the manufacturers who had too much pride in their business and respect for the confidence of their purchasers to use anything but high grade materials. So the manufacturers and general agents in question became ardent advocates of the old law, although the burdensome tag tax, registration fees, etc., cost them more than it does now, and no one heard from them of the inconvenience or expense of attaching a

tag that placed the same value on inferior materials that it did on the most expensive materials. Those now in charge of this office took the first opportunity to secure the enactment of a law that was not exactly in tune with the opportunities referred to and the fault that has been found with it is no surprise; indeed, it is the best recommendation that could possibly come from such sources.

Thousands of copies of the old law and the new one have been distributed among the farmers of this State, so it should be no very difficult matter to establish the fact that there are but three points in which there is any difference between the two. The New Law requires: 1—that the agent shall notify the Director of the Station as to the kind, amount, place and approximate time of delivery of fertilizers shipped into the State. The object of this requirement is obvious, and there have been no objections to it.

2—The necessary revenues for maintaining the fertilizer inspection are put on a tonnage basis, absolutely fair to all concerned, and which, as a matter of fact, requires less of the fault-finders than of the manufacturers whose business integrity has secured for them a much larger part of the trade in this State, but who, by the way, are having no fault to find.

3—The only other change in the original statute may be summed up in nine words, to-wit: “and the materials from which said constituents are derived,” and this is the particular place where the shoe pinches. This is the real reason for all the complaints to date. A certain class of manufacturers have so long been profiting by the sort of deceptions these nine words are so well calculated to prevent that they have come to regard them as but another one of their “privileges”; hence the howl. This office is thoroughly advised and intends to keep advised, as to the firms who have so suddenly become so anxious to deliver the agents and farmers of this State from the burdensome “tag tax” and the inconvenience and expense of attaching tags, etc. In

view of the hundreds of thousands of dollars that go out of this State to the manufacturers of commercial fertilizers every year, somebody ought to know who the manufacturers are who object to contributing their share to the inspection work in this State, no matter what may be their real reason for such objections. In the cases above referred to (and as is usually the case) the objection is but the expression of the unwillingness to discontinue the sort of practices but for which fertilizer laws would be unnecessary.

It should be needless to add that for the great majority of manufacturers, such a requirement would be unnecessary, so far as it has to do with uniformity of composition. They have too much faith in the formulas that have stood the test of so many years and too much pride in their business to quibble about the "privilege" ("if convenient") of selling out so cheaply the confidence of those who have learned to appreciate the merits of such formulas. For such manufacturers the law has no hardships. With them a brand means something, and they could file their affidavit for ten years in the future. Indeed, for such manufacturers the law has a decided advantage, in that it enables the purchaser to readily pick out the brands that really stand for something. There is, of course, the other and greatest of all advantages in that the farmer is provided with all necessary information to enable him to make the very best possible use of the fertilizer. The fact that many farmers do not yet understand the reasons for using a constituent in one form rather than in another, is to be regretted, but it might be added that there is no lack of manufacturers who don't seem to be very much better informed than the farmers. Nor does the ignorance in question end here. It has not been more than a thousand years since a Professional Agriculturist in a State institution, in publishing the results of certain "investigations" involving actual field tests with fertilizers, stated that a "commercial fertilizer costing" so much per bag gave only such and such results, "while "a home mixed fertilizer" gave almost as good results as farmyard

manure, without even mentioning the kind or amount of any constituent used, much less the materials used as the sources of the constituents. He didn't even mention the size of the "bag." He did say that the freight on it was about so much, without saying how far it had been shipped. This is, of course, an extreme case, and possibly the worst to date, but the difference in altogether too many cases is one of degree, rather than of kind. One can take the reports of only too many "actual field tests with fertilizers," and prove almost anything he pleases. There is a reason for such confusion, and there can be little doubt but that altogether too much of it could be easily traced to this same lack of appreciation of the materials from which the various added constituents were derived. Too many such investigations have attributed the whole results to the differences in the amount of phosphoric acid, nitrogen or potash used, completely ignoring the effect of the materials with which these constituents are necessarily united or associated, the effect of which is just as sure to follow and possibly be responsible for the greater part of the "results." So, then, while it must be admitted that the farmers do not appreciate to the extent that might be desired the importance of using a constituent in one form rather than another, it must also be admitted that such lack of appreciation is not limited to them, but is well represented among manufacturers and others, who would naturally claim to be much better informed. This office could think of no better way of enforcing such an appreciation than to have the manufacturers state the sources of the constituents claimed, and keep such statements continually before the purchasers.

Bulletin 80, of this Station, discusses at some length the effect of the various materials used as sources of the various constituents of commercial fertilizers. Many farmers claim that it has been of much assistance to them. Differences in the "form" of a constituent are very largely a matter of the other materials with which the constituent in question is necessarily united or associated. It is these other materials and their effects that are

too often overlooked. The fact that one has phosphoric acid in mind when he applies phosphate of lime to the soil, does not prevent the lime from exerting its full effect and with just as much certainty as if it had been the "constituent" for which the application was made. The following paragraphs may be of service in calling attention to these various materials with the phosphoric acid, potash and nitrogen are associated in their various forms.

*Bones* are used to furnish phosphoric acid and nitrogen, but they do not consist entirely of these materials. They contain organic matter, lime, magnesia, etc., but as these other constituents can do no harm and may do good, bones are and have long been recognized as a perfectly safe and valuable source of phosphoric acid and nitrogen. Like most other organic manures, bones are rather slow in their action. They must first decompose and such decompositions are always more or less a matter of circumstances, including the character of the soil, season, etc. Decomposition is hastened by steaming the bones, thus removing the useless fats and greases which would otherwise exclude the necessary moisture and air. The finer they are ground the more surface will be exposed to the action of soil, water and air, and the more quickly they will decompose. For permanent pastures and slow-growing crops there is no better source of phosphoric acid and nitrogen. It should be observed, however, that before plants can use the nitrogen in bones or any other organic materials, it must be converted into nitric acid or some compound of nitric acid, by a process or series of decompositions known as nitrification, which is accomplished in the soil by certain minute organisms known as bacteria, and that these are rather particular as to the conditions under which they will work; *e. g.* they will not work in a sour soil, and the best results need not be expected from an application of bones or any other organic nitrogenous material to an acid soil. The remedy for an acid soil is lime. (See Bulletin No. 80).

*Dissolved Bones.* In order to make the phosphoric acid and

nitrogen in bones immediately available, bones are treated (dissolved), in sulphuric acid. This is all very well for the phosphoric acid and nitrogen, but how about the other constituents, (lime, magnesia, etc.), of the bones. Well, the lime and magnesia are converted into sulphates. The two materials are very much alike, and everyone knows that the sulphate of lime (gypsum) is not likely to do any harm; indeed, it is very likely to prove a valuable addition to the soil. So, when phosphoric acid and nitrogen are added to the soil, in the form of bones or dissolved bones, the other materials added require no attention, as they can do no harm and will probably do good. For slow-growing crops no one is likely to make a mistake in applying phosphoric acid and nitrogen in the form of ground bone. For quick-growing crops no one is likely to make a mistake in applying these constituents in the form of dissolved bones.

*Dissolved Phosphate Rock* is sometimes called "Dissolved Bone" or "Dissolved Bone Phosphate." Such terms are, of course, misleading, but they are not necessarily intended to deceive, as they are well recognized by the trade. It is quite possible that phosphate rock is but the remains of the skeletons of prehistoric animals. It consists for the most part of the mineral constituents of bones, necessarily mixed with other earthly materials. Of course all nitrogen and organic matter worth mentioning has long since disappeared. The earthy materials with which the original bone constituents have become contaminated need no special attention, as they are found in abundance in all good soils. They simply dilute the phosphate of lime and make it necessary to use more sulphuric acid to convert the phosphate into available form, but in the manufacture of soluble phosphates (acid phosphates) from phosphate rock, no objectionable products are formed, certainly not if the process is properly carried out, as it almost invariably is at present. It is also to be observed that while untreated ground bone decomposes much more quickly than the untreated ground phosphate rock, such differ-



ence does not obtain for the bone and rock when treated with the sulphuric acid, for the phosphate of lime in the bone and the phosphate of lime in the rock are both converted into the same soluble, or "available" phosphate of lime, and that so far as the soluble phosphoric is concerned there is no advantage in using bones to make acid phosphates. It is sometimes claimed that the acid in the acid phosphates will parch or otherwise injure the soil, while real dissolved bones, being just simply bones dissolved, can have no such effect and so are much to be preferred, but as has just been stated, both are made by the same process. There is no more "acid" in the acid phosphate made from rock than in that made from bones. The soluble phosphate produced in each case is one and the same thing always, and requires exactly the same amount of lime for its fixation in the soil, which amount is less than the actual phosphoric acid added, while a normal soil will contain at least 3,000 lbs. of lime in the surface foot per acre. Even the small quantity of lime required to effect the fixation of the soluble phosphate is not lost to the soil, but is either used by the plant or set free when the phosphoric acid is used. There is absolutely no reason why acid phosphates should tend to parch or sour or in any way injure the soil, indeed their action is in just the opposite direction. As a source of available phosphoric acid there is nothing better than a plain acid phosphate made from the phosphate rock.

*Bone Tankage* is the material remaining in the large tanks used in the slaughtering establishments for boiling cattle heads, hoofs, clippings and animal refuse matter generally. A number of grades are found on the market, varying in phosphoric acid from 10 per cent. to 20 per cent. and in nitrogen from 4 per cent. to 9 per cent. Even these wide limits will not include all the tankage on the market. The composition of some varieties approaches that of bone, while a material known as "concentrated tankage" and prepared by evaporating the fluids obtained in the extraction processes contains very little phosphoric acid, but may

contain as much as 12 per cent. of nitrogen in quickly available form. What was said in regard to ground bone will suffice for crushed tankage, if it is borne in mind that the latter contains more organic matter and must have favorable conditions for the best results. Contrary to popular notions, it is the tankage and other materials rich in organic matter that contribute most to an acid condition of the soil and which are likely to give the most indifferent results when such a condition exists. Of course there is not so much as a ghost of an excuse for allowing a soil to get in such a condition, and yet this indisputable tendency of the materials in question must not be overlooked.

In order to make the phosphoric acid and nitrogen more quickly available (and with greater certainty), crushed tankage, like ground bone, is often treated with sulphuric acid. The product is known as dissolved tankage, but has so much in common with dissolved bones that further comment here is unnecessary. The concentrated tankage referred to decomposes so quickly that such treatment is unnecessary. The same is true of dried blood, meat meal guano, azotine and certain other highly nitrogenous animal products.

Speaking of highly nitrogenous animal products naturally recalls hair, hoof-meal, bone-meal and leather-meal, which may contain as much as 15 per cent. of nitrogen, but which decompose so slowly that they are of little value as a manure. They are to be recommended only to those who believe in feeding the soil, rather than the crop, or to those who attach so much importance to the "lasting effects" in regard to which one always hears so much, for these materials have lasting properties to give away; indeed, they are likely to last so long that no one will ever know just when they did become available. Such materials can be used to greatly increase the nitrogen content of a fertilizer (without adding anything to its value) in States where the fertilizer laws recognize only the *amount* of the various constituents, ignoring "the materials from which said constituents are derived."

Some States have enacted laws forbidding the use of such materials, but the law-makers of this State did not think best to incorporate such a requirement and they were right. Those who believe in lasting effects pay taxes. They also pay the fiddler for their belief. They ought not to be deprived, by law, of such an opportunity to confirm their faith, at least so long as anyone is willing to admit that he has such materials for sale and sells what he claims to sell.

In dealing with animal or vegetable products, (organic materials), one point is always in order, and that is, that plants were not designed to feed on vegetable or animal matter and that a constituent in such form is not the more palatable to them. On the contrary, they cannot use any constituent of any vegetable or animal tissue until it has been completely decomposed or broken down into the same original mineral constituents used by the preceeding plant, and that such decompositions (in the soil) are always more or less a matter of conditions (soil, season, etc.), which may or may not always exist just at the right time. In other words, there is always about so much uncertainty attending the use of any constituent in the form of an untreated organic material. The more quickly decomposable and consequently more quickly available materials may usually be relied upon, and those requiring more time may often be used to decided advantage on slow-growing crops, while if such materials are properly selected for a particular crop, on a particular soil, and the season is also favorable, there may even be an advantage in that, the decompositions taking place just right, the crop will be fed more uniformly than if the constituents were immediate available. However, the fact must not be overlooked that in order to use such materials to best advantage the conditions in question must obtain.

*Sulphate of Ammonia* is an important source of nitrogen. It is immediately soluble and in a normal soil, under anything like fair conditions, is quickly available. Many believe a constituent

is immediately available because it is immediately soluble (in water), *e. g.* the availability of the soluble phosphate of lime, which, as a matter of fact, is quickly converted by the soil into an insoluble form, which owes its availability to the minuteness of its particles and the uniformity of their distribution among the soil particles. Sulphate of ammonia is an example of a material that is immediately soluble, not necessarily converted by the soil into an insoluble form and yet not immediately available. Of course plants can use some nitrogen in the form of ammonia, but this is not the rule. Plants want their nitrogen in the form of nitric acid or some compound of nitric acid. The transformation from ammonia to nitric acid in the soil involves but a few steps, which, under favorable conditions are quickly accomplished. It is for this reason that sulphate of ammonia is one of the most reliable sources of nitrogen, but the few steps must be taken and the conditions must obtain. The process involved is the one already referred to,—nitrification, and the conditions do not obtain in a soil that is dry or sour or water-logged or gorged with organic matter. There are well established cases where sulphate of ammonia, on acid soils gave worse results than no fertilizer at all. Again it is to be observed that in a state with limestone in every other hillside, in some cases a hundred feet thick, there is no excuse for an acid soil, and yet so long as so many agriculturalists, practical and professional are stuffed full of the notion that the soil must be stuffed full of organic matter which, on decomposing may produce an acid condition, it may be just as well to call attention to the materials which tend to aggravate such a condition. Under anything like fair conditions sulphate of ammonia is a very quick acting and valuable source of nitrogen; indeed, it stands next to

*Nitrate of Soda.* The great majority of the materials used as fertilizers are converted by the soil into other forms before being used by plants. As a matter of fact such added materials are sooner or later converted into just such forms as plants would

use in a soil to which no such additions had been made. This does not support to any very considerable extent the notion that commercial fertilizers are “artificial” or “unnatural,” but it is nevertheless a fact, and a very fortunate one for modern agriculture. Conspicuous among the materials that need no such transformations, but which can be used by plants in the form in which they are applied as a fertilizer is nitrate of soda. It is immediately soluble and immediately available. The only danger is in loss by leeching, for the soil can not convert it into an insoluble form, and unless it is used at once it is liable to be lost. It should be applied when it is needed. As it does not have to undergo any decompositions in the soil before becoming available it is more certain in its action than the organic materials mentioned. It is simply a compound of nitric acid and soda and so contains nothing that can possibly be injurious; in fact, the action of the soda is just the reverse of that of other materials with which the nitrogen in most other forms is associated.

*The Potash* in commercial fertilizers is obtained almost entirely from the famous Stassfurt deposits.

The potash of the Stassfurt salts exists in two forms, the chloride, which is probably better known as muriate, and the sulphate. Both are readily available and securely fixed in the soil. There is a difference, however, in the diffusibility of the two forms, the chloride having the advantage in this respect, for experience shows that it will distribute itself through a larger volume of soil before becoming fixed.

There is another difference between these two forms that demands more careful attention, and this has to do with their effect on certain crops. Sulphates, as a rule, are a valuable addition to the soil, and the sulphate of potash may be used indiscriminately on any and all crops; but the same is not true of the chloride of potash, for while this may be depended upon to produce a corresponding increase in the yields, it is likely to injure the quality of certain crops, and these, unfortunately, are among the

crops requiring potash in the largest quantity. The chloride of potash injures the burning qualities of tobacco, and as the value of tobacco depends so largely upon this quality, the chloride of potash should never be used on this crop. The chloride of potash will give to potatoes a waxy consistency, and increase the impurities and lower the sugar content of sugar beets; so it is the sulphate of potash that should be used on these crops. On the great majority of crops, as grains and grasses, it makes little or no difference which form is used, and the chloride being the cheaper may often be used to advantage; in fact, there are cases in which it even gives better results than the sulphate, *e. g.* on hemp and certain other fibre plants, where it tends to lengthen and toughen the fibre.

When the chloride of potash is applied to the soil, the potash becomes fixed, the chlorine with which the potash was combined, being left to combine with some other constituent of the soil, usually lime, to form chloride of lime. This chloride of lime, or calcium chloride, is very injurious to the rootlets of young plants, but it is an extremely soluble material, and the soil has no power to hold it, so it is quickly leached out in the drainage water. This suggests a method of using the chloride of potash that would avoid much of the injurious effects; apply it as long as possible before the crop is planted. If applied in the fall, the winter rains may be depended upon to either wash out the chlorides or carry them so far into the lower layers of the soil that they will be out of the reach of young plants beginning their growth in the spring.

It should be distinctly understood that the differences above referred to are not due to any difference in the actual potash (which is one and the same thing in both forms, and the world over) but to the materials with which the potash is associated. When the potash becomes fixed in the soil it parts company with these materials to unite with the silicates, etc., and in uniting with these the various forms of potash applied to the soil as fer-

tilizers are converted into forms very similar indeed to the quickly available potash already in the soil. A part of the potash found on the market is in the form of chloride of potash, which is the cheapest form of potash available at the present time. On certain crops chlorides are injurious and the above is to show how the injurious effect of *chlorides* (not potash) may be avoided.

*Kainit* is doubtless the best known of the crude Stassfurt salts. It contains about 12.5 per cent. of actual potash, practically all of which is in the form of sulphate. It also contains large quantities of chloride of soda (common salt) and chloride and sulphate of magnesia, so, notwithstanding the fact that the potash is in the form of sulphate, the large excess of chlorides with which it is associated, causes kainit to act very much like the chloride of potash, and the same precautions should be observed in using it.

*Sylvinit* is another crude product, similar to kainit, in that it contains large quantities of common salt, chloride of magnesia, etc. The actual potash, which is in the form of chloride and sulphate, will average about 16 per cent. In this country it has not been used to the same extent as kainit.

The crude potash salts, such as kainit, sylvinit, manure salts, etc., contain not only chlorides (such as chloride of potash, chloride of soda or common salt) but they also contain considerable quantities of magnesia. Recent investigations go to show that too much magnesia in a soil is very undesirable, as it may, if present in large excess, reduce a soil to the verge of sterility, even when the soil is normal in all other respects. From the investigations referred to it appears that good results need not be expected if the soil contains more magnesia than lime. Crude potash salts not only remove some of the lime, but add to the magnesia. On the other hand, too large an excess of lime is not desirable, and in such a case the crude salts might be used to advantage. Farmers must study their soils.

*Muriate of Potash.* Of the manufactured products, muriate

(chloride) of potash is the most generally used. Several grades of this material are to be found on the market, some of them running as high as 93 per cent. chloride of potash. The most popular grade in the country is about 80 per cent. pure, and contains about 50 per cent. potash.

It will be observed that there are just about four times as much actual potash in this high grade muriate as in kainit, and notwithstanding the marked difference in price, a little figuring (including freight rates, etc.), will show that the muriate is much the cheaper form. It is also to be observed that in using the high grade muriate (although this is almost pure chloride of potash) a smaller amount of chlorides will be applied to the soil than if the same amount of potash in the form of kainit be used. The muriate is the cheapest form of potash on the market to-day, and for the great majority of crops (and with the simple precautions already mentioned) it is for most purposes all that could be asked in the way of a potash fertilizer.

*High Grade Sulphate of Potash* is usually sold on a purity basis of 98 per cent., or an equivalent of 53 per cent. actual potash. It is used extensively in the manufacture of commercial fertilizers, and is undoubtedly the best form of potash for agricultural purposes obtainable at the present time. It is to be preferred to the muriate because it can be used on any crop at any time. It is one of the most expensive forms of potash, and yet, the prices often paid for kainit would purchase an equivalent amount of potash in the form of high grade sulphate.

The Stassfurt potash salts are quite capable of meeting every demand of the soil for potash, and when they are applied (observing the precautions above mentioned) to a soil deficient in potash and fail to bring reasonable returns, the trouble is due to a lack of lime or to some other abnormal condition of the soil, not to the potash salts.

The following table will be of service in showing the form in which the potash exists in the various potash salts, the amount of



chlorine and other materials present and the amount of chlorine that should be found for one per cent. of potash in the various forms claimed:

*A complete list of all Potash Salts used in Agriculture and their composition, as calculated from an average of many Analysis.*

| NAME OF SALTS   | SULPHATE OF POTASH             | MURIATE OF POTASH | SULPHATE OF MAGNESIA | CHLORIDE OF MAGNESIA | CHLORIDE OF SODIUM | SULPHATE OF LIME   | Substances Insoluble in Water | WATER | calculated to Pure Potash | Total Per cent Chlorine | Percent. of Chlorine for 1 per cent of Potash |
|---|--------------------------------|-------------------|----------------------|----------------------|--------------------|--------------------|-------------------------------|-------|---------------------------|-------------------------|---|
|   | K <sub>2</sub> SO <sub>4</sub> | K Cl              | Mg SO <sub>4</sub>   | Mg Cl <sub>2</sub>   | Na Cl              | Ca SO <sub>4</sub> |                               |       | K <sub>2</sub> O          |                         |   |
| In 100 parts are contained .....                        |                                |                   |                      |                      |                    |                    |                               |       |                           |                         |   |
| A. CRUDE-SALTS (Natural-Products),                      |                                |                   |                      |                      |                    |                    |                               |       |                           |                         |   |
| 1. Kainit. ....   | 21.3                           | 2.0               | 14.5                 | 12.4                 | 34.6               | 1.7                | 0.8                           | 12.7  | 12.8                      | 31.2                    | 2.50  |
| 2. Carnallit. ....                                      | —                              | 15.5              | 21.1                 | 21.5                 | 22.4               | 1.9                | 0.5                           | 26.1  | 9.8                       | 36.9                    | 3.90  |
| 3. Sylvinit. ....                                       | 1.5                            | 26.3              | 2.4                  | 2.6                  | 56.7               | 2.8                | 3.2                           | 4.5   | 17.4                      | 50.1                    | 2.90  |
| B. CONCENTRATED SALTS (Manufactured Products,)          |                                |                   |                      |                      |                    |                    |                               |       |                           |                         |   |
| a. Sulphates, nearly free from Chloride.                |                                |                   |                      |                      |                    |                    |                               |       |                           |                         |   |
| 1. Sulphate of Potash } 96 per cent. ....               | 97.2                           | 0.3               | 0.7                  | 0.4                  | 0.2                | 0.3                | 0.2                           | 0.7   | 52.7                      | 0.6                     | 0.01  |
| 2. Sulphate of Potash } 90 per cent. ....               | 90.6                           | 1.6               | 2.7                  | 1.0                  | 1.2                | 0.4                | 0.3                           | 2.2   | 49.9                      | 2.1                     | 0.04  |
| 3. Sulphate of Potash-Magnesia. ....                    | 50.4                           | —                 | 34.0                 | —                    | 2.5                | 0.9                | 0.6                           | 11.6  | 27.2                      | 1.5                     | 0.06  |
| b. Salts containing Chloride.                           |                                |                   |                      |                      |                    |                    |                               |       |                           |                         |   |
| 1. Muriate of Potash } 90-95 per cent. ....             | —                              | 91.8              | 0.2                  | 0.2                  | 7.1                | —                  | 0.2                           | 0.6   | 57.9                      | 48.1                    | 0.80  |
| 2. Muriate of Potash } 80-85 per cent. ....             | —                              | 83.5              | 0.4                  | 0.3                  | 14.5               | —                  | 0.2                           | 1.1   | 52.7                      | 47.3                    | 0.90  |
| 3. Muriate of Potash } 70-75 per cent. ....             | 1.7                            | 72.5              | 0.8                  | 0.6                  | 21.2               | 0.2                | 0.5                           | 2.5   | 46.7                      | 47.7                    | 1.00  |
| 4. Manure-Salts, containing at least 20 p'r c't. Potash | 2.0                            | 31.6              | 10.6                 | 5.3                  | 40.2               | 2.9                | 5.3                           | 4.2   | 21.0                      | 43.3                    | 2.20  |
| 5. Manure-Salts, with at least 30 per c't. Potash.      | 1.2                            | 47.6              | 9.4                  | 4.8                  | 26.2               | 2.2                | 3.5                           | 5.1   | 30.6                      | 42.0                    | 1.40  |

In the following report of the inspection and analysis of fertilizers found on sale in the State, a number of new terms appear among those already familiar to readers of the reports of this office, while one item, the valuation, has been omitted. The usual statements in regard to the soluble, reverted, total and available phosphoric acid guaranteed and found are presented, not in the form of a table, as heretofore, but in much more readable form. These statements include all the information necessary to enable one to purchase and use the various forms of phosphoric acid intelligently.

As often as nitrogen is claimed an availability test is reported. It should be understood that these figures are relative, that is to say, if the nitrogen in one fertilizer gives an availability test of 80, while another gives a test of 40, it is safe to assume that on a normal soil, under fair conditions, twice as much of the nitrogen in the first case will be quickly available as in the last. As relative figures they are not very far wrong; as absolute figures, it can only be said that they are obtained by the methods of the American Association of Official Agricultural Chemists, and so are undoubtedly as nearly in accord with actual field tests as is possible at the present state of the sciences involved. There are many opportunities for these figures to be misleading within certain limits, unless properly understood; for example, "dried blood" might be claimed and dried blood might be used, but it might be carelessly dried, dried too much, or at too high a temperature. It would give too low a test in the laboratory and in the field. Again, it should be observed that these tests are based upon what might be called an average crop on an average soil during an average season. The dried blood, for example, might be the very best obtainable, but if used on an acid soil or a soil that did not need nitrogen, or for a quick-growing crop, when the season was unfavorable to nitrification at the time the crop needed its nitrogen, or favorable later when it could only prolong the period of growth favoring stalks and stems at the expense of the grain or fruit, or the promotion of

fungious diseases, the tests will not be in accord with the figures given. A number of brands registered this year claim nitrogen in the form of "Bone Tankage," which was undoubtedly used. The availability tests, however, are low, because the material was unusually coarse. Here, again, the field tests will be in accord with the laboratory tests. Examples might be multiplied almost indefinitely, but suffice it to say that these availability tests as carried out by this office represent the best efforts of those most competent to deal with these problems and the results as stated, are a reasonably reliable and valuable guide in selecting and applying the various nitrogenous materials used in fertilizers.

Examinations in the laboratories here are not limited to the availability tests reported, but include microscopical and any other tests calculated to disclose whether or not the nitrogen (or any other constituent) is derived from the materials stated. The results of such findings are given in the remarks which in the case of nitrogen it is gratifying to note are conspicuous on account of their absence, and the nitrogenous materials used in the fertilizers as sold in the State this year, with few exceptions, make a good showing. When manufacturers understand that they will get full credit for the materials actually used there is some incentive to use the very best they can for the prices they expect to charge; indeed, if there ever is a time when a manufacturer would be excusable for using less dried blood and more hoof-meal, it would be when he is compelled to do business with a statute that recognizes no difference between such materials but "values" them both alike. The fact that manufacturers even under such circumstances so infrequently resort to such practices is an argument for business integrity and business pride that cannot be discounted by any other business on earth.

In the case of Potash, the matter of availability is practically one of minor importance, as almost without exception the materials claimed and used are immediately available. The matter of greatest importance is the chlorides, with which so many potash salts are associated. It is for this reason that the results

of the examination as to the materials from which the potash is derived are stated in terms of chlorine. The amount of chlorine contained in the various potash salts used in commercial fertilizers may be found in the table (under potash), already given.

*Valuations* are not required by the New Law and so are not found in the report. There are a number of good reasons for this. A valuation may be right at the time it is published, but long before another report can appear prices may change. It is the only figure in a fertilizer report that is sure to be unfair to some one some time. Of course a valuation may only claim to be relative, but even in this case local conditions may make it advisable for manufacturers or dealers to cut prices on certain classes of goods and so it goes. There was a time in this, as in every other State, when the figures with a dollar mark in front of them meant more to many purchasers than any other figures on the tags, but that time is passed. And after all and even if the valuations could be absolutely correct at all times, why should not a farmer keep himself posted as to prices current of the materials he may need for fertilizers, just as he does in the case of corn, wheat, oats, hay and every other commodity in which he is interested. This is the only solution for the valuation problem, and it leaves the fertilizer laws to begin and end, as they should, with providing just such and only such information as in the nature of the case cannot otherwise be obtained. The prices of materials used in the manufacture of commercial fertilizers as given in the following list may be relied upon. They are taken from the *Oil, Paint and Drug Reporter*, March 9th, 1903, and are the last quotations obtainable before this report goes to the printer. It should be needless to add that they are for large lots. Smaller purchasers would have to pay higher prices and might not be able to obtain some materials at any price.

## AMMONIATES.

|                             |                      |             |
|-----------------------------|----------------------|-------------|
| Sulphate of Ammonia, .....  | Cwt. ....            | 3.10@3.125  |
| Nitrate of Soda,.....       | Cwt. ....            | 1.95@1.975  |
| Blood, dried, red,.....     | Unit (20 lbs.) ..... | 2.65@2.70   |
| Concentrated Tankage, ..... | Ton, .....           | 15.00@16.00 |
| Fish, Guano, dried,.....    | Ton, .....           | 27.00@28.00 |
| Fish, acidulated,.....      | Ton, .....           | 14.00@      |

## PHOSPHATES.

Phosphate Rock, F. O. B.,

|                                 |             |             |
|---------------------------------|-------------|-------------|
| Charleston, .....               | Ton, .....  | 5.00@ 7.00  |
| Phosphate Rock, F.O.B., Tenn... | Ton, .....  | 3.60@ 3.75  |
| Acid Phosphate, .....           | Unit, ..... | .60@ .675   |
| Bones, rough, .....             | Ton, .....  | 16.50@17.50 |
| Bones, ground, .....            | Ton, .....  | 20.00@21.00 |
| Bone Meal, .....                | Ton, .....  | 18.50@24.00 |
| Bone Black, refuse, .....       | Ton, .....  | 18.00@19.00 |

## POTASHES.

|                                   |             |            |
|-----------------------------------|-------------|------------|
| Double Manure Salt, 48@53 per ct  | Cwt. ....   | 1.12@ 1.15 |
| Sulphate of Potash, 90@98 pr ct   | Cwt. ....   | 2.11@ 2.18 |
| Muriate of Potash,.....           | Cwt. ....   | 1.83@ 1.95 |
| Kainit, 25 per ct. Sulphate,..... | Ton, .....  | 9.30@ 9.50 |
| Silvinit, 35@37 per ct.,.....     | Unit, ..... | .41@ .45   |

To the above prices of materials must be added the cost of manufacturing, the profit to the manufacturer, the freight and a commission to the agent. At every turn there are many matters to be taken into account. Many of these, however, are local and so are best known to the purchaser, *e. g.* the freight to his particular shipping point, or the amount of fertilizers sold there. If it is a good farming section, with a heavy fertilizer trade the agent can place orders with his companies that will secure lower prices and the farmers will get fertilizers cheaper than in a section with an indifferent fertilizer trade. There are many other points that

might be mentioned or that will suggest themselves. There is, however, one that should not be overlooked, and that is the possible losses from bad sales, against which the agent must fortify himself. Sometimes it is the agent, sometimes the manufacturer who loses (according to the nature of the contract), but in the long run it is the farmers of that section and unfortunately the farmers who pay their debts; and they may pay good interest on such losses for some years to come. The average fertilizer agent in West Virginia can ill afford to lose the price of more than two or three carloads of fertilizers in a year, so it does not take more than about so many bad sales to put him out of the business. A new man takes his place; possibly a half dozen new men, none of them so well known to the manufacturers, who proceed to fortify themselves, and so it goes. Representatives of the various fertilizer companies are always quick enough to say that West Virginians are in the front rank when it comes to paying their debts, and this is doubtless true. The subject is simply mentioned as one of the many local factors affecting the retail price. It is probably safe to say that the majority of manufacturers would be only too glad to accept as their profit on most of their brands the difference between the highest and lowest price which local conditions (freight, amount of goods sold, etc.), make it necessary to charge the farmers in different sections. The farmer is better informed on local conditions than anyone else. It but remains for him to keep himself posted on the prices of fertilizer materials, etc., and whenever he demands it such quotations will come regularly to his fireside in every paper that dare claim to be "agricultural." This is the only solution to the "valuation" problem.

The following schedules of prices were used during the year 1902, in the States named:

## NEW ENGLAND STATES AND NEW JERSEY.

|  | Cents per lb |      | Value of 1902 in per cent of those of 1901. |
|--|--------------|------|---|
|  | 1901         | 1902 |   |
| <b>Nitrogen:</b>   |              |      |   |
| In ammonia salts .....                                   | 16½          | 15½  | 100   |
| In nitrates .....  | 14           | 14   | 100   |
| In dry and fine-ground fish.....                         | 16           | 16½  | 100.1                                       |
| In meat, blood and mixed fertilizers.....                | 16           | 16½  | 100   |
| In fine-ground bone and tankage.....                     | 16           | 16½  | 100   |
| In coarse bone and tankage.....                          | 12           | 12   | 100   |
| <b>Phosphoric acid:</b>                                  |              |      |   |
| Water soluble.....                                       | 5            | 5    | 100   |
| Citrate soluble.....                                     | 4½           | 4½   | 100   |
| In Cotton-seed meal, castor pomace and wood ashes, ..... | 4            | 4    | 100   |
| In dry, fine-ground fish, bone and tankage.....          | 4            | 4    | 100   |
| In coarse fish, bone and tankage.....                    | 3            | 3    | 100   |
| In mixed fertilizers, insoluble, .....                   | 2            | 2    | 100   |
| <b>Potash:</b>   |              |      |   |
| In forms free from muriate (chlorid).....                | 5            | 5    | 100   |
| As muriate, .....  | 4¾           | 4½   | 100   |



## PENNSYLVANIA.

|   | Cents per pound. |
|---|------------------|
| <b>Nitrogen:</b>  |                  |
| In ammonia salts,.....                                    | 16½              |
| In nitrates, .....  | 14               |
| In meat, dried blood and mixed fertilizers, .....         | 16½              |
| In cotton-seed meal and castor pomace, .....              | 16½              |
| In fine ground bone and tankage,.....                     | 11               |
| In coarse bone and tankage, .....                         | 9                |
| <b>Phosphoric acid:</b>                                   |                  |
| Soluble in water, in bone fertilizers, .....              | 5                |
| Soluble in water, in rock fertilizers, .....              | 3                |
| Soluble in ammonium citrate, in bone fertilizers, .....   | 4½               |
| Soluble in ammonium citrate, in rock fertilizers, .....   | 2½               |
| Insoluble in ammonium citrate, in bone fertilizers, ..... | 2                |
| Insoluble in ammonium citrate, in rock,.....              | 1½               |
| In fine bone, tankage and fish, .....                     | 3                |
| In coarse bone and tankage, .....                         | 2½               |
| In cotton-seed meal, castor pomace and wood ashes, .....  | 4                |
| <b>Potash:</b>  |                  |
| In high-grade sulfate or in forms free from muriate, .    | 5                |
| As muriate,.....  | 4¼               |

Potash in excess of that equivalent to the chlorin present, will be valued as sulfate, and the remainder as muriate.

Nitrogen in mixed fertilizers will be valued as derived from the best sources of organic nitrogen, unless clear evidence to the contrary is obtained.

Phosphoric acid in mixed fertilizers is valued at bone phosphoric acid prices, unless clearly found to be derived from rock phosphate.

Bone is sifted into two grades of fineness: Fine, less than 1-50 inch in diameter; coarse, over 1-50 inch in diameter.

The result obtained by the use of this schedule does not cover the items of mixing, bagging, freight and agents' commission. To cover these, allowances are made as follows:

For freight, an allowance of \$2.00 per ton on all fertilizers.

For bagging, an allowance of \$1.00 per ton on all fertilizers, except when sold in original packages.

For mixing, an allowance of \$1.00 per ton on complete fertilizers and rock-and-potash goods.

For agents' commission, an allowance of 20 per cent, is added to the cash values of the goods ready for shipment.

The mean quotation on freight from New York, Philadelphia and Baltimore to Harrisburg, in January, 1897, was \$1.68 per ton, in lots of twelve tons or over; in May, 1899, quotations by the Pennsylvania Railroad were: From New York, \$2.40; from Philadelphia, \$1.70; and from Baltimore, \$1.55; mean rate from the three points, \$1.88.

### KENTUCKY.

**Values Used.**—In calculating the relative value per ton, the following values have been used:

Soluble and reverted phosphoric acid in mixed fertilizers....63 per lb.

Soluble and reverted phosphoric acid in plain acid and unacid-

ulated phosphates, .....4c per lb.

Insoluble phosphoric acid in mixed fertilizers,.....2c per lb.

Insoluble phosphoric acid in plain acid phosphates,.....Nothing.

Phosphoric acid in fine bone, .....4c per lb.

Phosphoric acid in medium bone,.....3c per lb.

Fine bone is all that passes through a sieve with meshes one-twenty-fifth inch square. Medium bone passes through a sieve with meshes one-sixth inch square, but does not include fine bone.

|  |             |
|--|-------------|
| Nitrogen in all fertilizers .....              | 15c per lb. |
| Potash in all fertilizers, from sulphate,..... | 6c per lb.  |
| Potash in all fertilizers, from muriate,.....  | 5c per lb.  |

The term "Potash from muriate" does not indicate necessarily that the manufacturers used muriate of potash in furnishing the potash; they may have used sulphate of potash, or other salts of potash, but in all fertilizers where the term "Potash from muriate" is used there is enough chlorine present to combine with the potash, either from salt in the tankage used, or the potash salts used, as muriate, kainit, carnallite, etc. As the objection to the use of muriate of potash arises from the chlorine present in this salt, it likewise follows that chlorine in a fertilizer is objectionable, whether put in with the potash or otherwise. The using of sulphate of potash where there is chlorine present in other ingredients of the fertilizer will not obviate the injurious effect of the chlorine, and therefore we take this method of showing chlorine present by designating the potash as "from muriate."

## VIRGINIA.

### In Unmixed or Raw Materials.

|                                      |             |
|--------------------------------------|-------------|
| Available Phosphoric Acid, .....     | 4c per lb.  |
| Phosphoric Acid in Animal Bone,..... | 3½c per lb. |
| Ammonia, .....                       | 13c per lb. |
| Potash, .....                        | 4¾c per lb. |

### In Mixed Fertilizers.

|                                  |             |
|----------------------------------|-------------|
| Available Phosphoric Acid, ..... | 4½c per lb. |
| Ammonia, .....                   | 15c per lb. |
| Potash, .....                    | 5c per lb.  |

### How Relative Values are Calculated.

In the calculation of relative values it is only necessary to remember that so many per cent. means the same number of pounds per hundred, and that there are twenty-hundred pounds in one ton (100x20=2,000 pounds—1 ton). Therefore, to find the value per ton, multiply the per cent. of each ingredient by 20, which gives the number of pounds of each ingredient in a ton, then multiply this result by the

price per pound of that ingredient, then add up the figures thus obtained for each ingredient, and the sum is the relative value per ton.

As an example, take 8—2— fertilizer, which means that the fertilizer contains 8 per cent. available phosphoric acid, 2 per cent. ammonia, and 2 per cent. potash.

### OHIO.

**Table No. 1—Mixed Fertilizers, with Potash.**

Ammonia,  $12\frac{1}{2}$  cents per pound, or \$2.50 per unit.

Available phosphoric acid, 5 cents per pound, or \$1.00 per unit.

Insoluble phosphoric acid, in bone,  $2\frac{1}{2}$  cents per pound, or 50 cents per unit.

Potash (actual) from sulphate,  $5\frac{3}{4}$  cents per pound, or \$1.15 per unit.

Potash (actual) from muriate, 5 cents per pound, or \$1.00 per unit.

**Table No. 2—Mixed Fertilizers, Without Potash.**

Ammonia,  $12\frac{1}{2}$  cents per pound, or \$2.50 per unit.

Available phosphoric acid, 5 cents per pound, or \$1.00 per unit.

Insoluble phosphoric acid, in bone,  $2\frac{1}{2}$  cents per pound, or 50 cents per unit.

Insoluble phosphoric acid, in mixed animal and mineral, 1 cent per pound, or 20 cents per unit.

**Table No. 3—Dissolved Bone.**

Ammonia,  $12\frac{1}{2}$  cents per pound, or \$2.50 per unit.

Available phosphoric acid, 5 cents per pound, or \$1.00 per unit.

Insoluble phosphoric acid,  $2\frac{1}{2}$  cents per pound, or 50 cents per unit.

**Table No. 4—Rock Phosphate.**

Available phosphoric acid, 5 cents per pound, or \$1.00 per unit.

**Table No. 5—Rock Phosphate and Potash.**

Available phosphoric acid, 5 cents per pound, or \$1.00 per unit.

Potash (actual) from sulphate,  $5\frac{3}{4}$  cents per pound, or \$1.15 per unit.

Potash (actual) from muriate, 5 cents per pound, or \$1.00 per unit.

**Table No. 6—Tankage.**

Ammonia, 9 cents per pound, or \$1.80 per unit.

Total phosphoric acid, 3 cents per pound, or 60 cents per unit.

**Table No. 7—Tankage and Potash.**

Ammonia, 9 cents per pound, or \$1.80 per unit.

Total phosphoric acid, 3 cents per pound, or 60 cents per unit.

Potash (actual) from sulphate,  $5\frac{3}{4}$  cents per pound, or \$1.15 per unit.

Potash (actual) from muriate, 5 cents per pound, or \$1.00 per unit.

**Table No. 8—Bones.**

Ammonia,  $12\frac{1}{2}$  cents per pound, or \$2.50 per unit.

Phosphoric acid in "fine" bone,  $3\frac{3}{4}$  cents per pound, or 75 cents per unit.

Phosphoric acid in "medium" bone, 3 cents per pound, or 60 cents per unit.

Potash, if found present, valued same as in Table No. 1.

**Table No. 9—Potash Salts.**

Potash (actual) from sulphate,  $5\frac{3}{4}$  cents per pound, or \$1.15 per unit.

Potash (actual) from muriate, 5 cents per pound, or \$1.00 per unit.

**Table No. 10—Nitrate of Soda.**

Ammonia,  $12\frac{1}{2}$  cents per pound, or \$2.50 per unit.

**Table No. 11—Precipitated Phosphate.**

Available phosphoric acid, 5 cents per pound, or \$1.00 per unit.

**Note.**—"Unit" is a trade expression used in speaking of the ingredients of commercial fertilizers, and means one percentum of a ton, or twenty pounds; e. g., ammonia,  $12\frac{1}{2}$  cents per pound, or \$2.50 per unit; that is, \$2.50 for twenty pounds.

# Analysis of Commercial Fertilizers--1902.

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GOODS OF

AMERICAN AGRICULTURAL CHEMICAL COMPANY,  
NEW YORK AND BALTIMORE.

4402 *GEM ALKALINE BONE*.. G. T. Hodges, Shepherdstown. *Guarantee*: Phosphoric acid, soluble, 4; reverted, 2; insoluble, 1; total, 7; available, 6; potash, 3; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 3.89; reverted, 3.88; insoluble, 0.49; total, 8.26; available, 7.77; potash, 3.10; \*chlorine, 5.1. *Remark*—*Chlorine excessive*.

4447 *GEM ALKALINE BONE*.. C. W. Siever, Keyser. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.77; reverted, 2.95; insoluble, 0.35; total, 9.07; available, 8.72; potash, 2.42; \*chlorine, 7.6. *Remark*—*Chlorine excessive*.

4454 *GEM ALKALINE BONE*. McKown & Buscy, Martinsburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.51; reverted, 3.02; insoluble, 0.36; total, 8.89; available, 8.53; potash, 3.17; \*chlorine, 6.8. *Remark*—*Chlorine excessive*.

4492 *GEM ALKALINE BONE*. J. W. Hedrick, Alderson. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 1.61; reverted, 5.06; insoluble, 0.78; total, 7.45; available, 6.67; potash, 3.11; \*chlorine, 6.0. *Remark*—*Chlorine excessive*.

4519 *GEM ALKALINE BONE*. Payne Bros., Seebert. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 1.24; reverted, 5.94; insoluble, 0.74; total, 7.92; available, 7.18; potash, 3.05; \*chlorine, 5.4. *Remark*—*Chlorine excessive*.

4576 *GEM ALKALINE BONE*. J. H. Miller & Sons, Martinsburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.01; reverted, 4.50; insoluble, 1.30; total, 11.81; available, 10.51; potash, 2.02; \*chlorine, 3.7.

4414 *REGULAR CORN FERTILIZER*. Washington & Alexander, Charles Town. *Guarantee*—Phosphoric acid, soluble, 4; reverted, 2; insoluble, 1; total, 7; available, 6; potash, 3; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 3.45; reverted, 4.08; insoluble, 0.38; total, 7.91; available, 7.53; potash, 3.20; chlorine, 5. *Remark*—*Chlorine excessive*.

4434 *BONE MEAL*. W. L. Cole, Clarksburg. *Guarantee*—Total phosphoric acid, 14; nitrogen, 1.65; phosphoric acid from animal bone, nitrogen from animal bone. *Found*: Total phosphoric acid, 18.86; nitrogen, 1.88; availability of nitrogen, 86.

4479 *BONE MEAL*. W. L. Cole, Clarksburg. *Guarantee*—(As above). *Found*: Total phosphoric acid, 17.53; nitrogen, 1.80; availability of nitrogen, 84.

4544 *FINE GROUND BONE*. C. W. Siever, Keyser. *Guarantee*—Total phosphoric acid, 23; nitrogen, 2.47; phosphoric acid from animal bone; nitrogen from animal bone. *Found*: Total phosphoric acid, 22.99; nitrogen, 3.10; availability of nitrogen, 88.

4611 *FINE GROUND BONE*. ——— Herring, Kingwood. *Guarantee*—(As above). *Found*: Total phosphoric acid, 21.26; nitrogen, 1.92; availability of nitrogen, 85.

4561 *PURE GROUND BONE*. A. G. Chrislip, Philippi. *Guarantee*—Total phosphoric acid, 20; nitrogen, 3.29; phosphoric acid from animal bone; nitrogen from animal bone. *Found*: Total phosphoric acid, 19.45; nitrogen, 3.45; availability of nitrogen, 73.

4537 *W. & A. SPECIAL FALL MIXTURE*. Washington & Alexander, Charles Town. *Guarantee*—Phosphoric acid, soluble,; reverted, 2; insoluble, 1; total, 9; available, 8; potash, 1; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 5.57; reverted, 2.12; insoluble, 1.48; total, 9.16; available, 7.68; potash, 1.32; chlorine, 3.6.

4645 *BRADLEY'S DISSOLVED BONE WITH POTASH*. A. P. Russell & Company, Buckhannon. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 1.03; potash, 2; Phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from animal bone, fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 2.57; reverted, 6.29; insoluble, 1.78; total, 10.64; available, 8.86; nitrogen, 0.92; potash, 2.45; chlorine, 2.3; availability of nitrogen, 86.

4373 *BRADLEY'S BEAN AND POTATO PHOSPHATE*. O. R. Carmen, Wellsburg. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 4; phosphoric acid from dissolved phosphate rock, fish and tankage; nitrogen from dissolved fish and tankage; potash from kainit and manure salts. *Found*: Phosphoric acid, soluble, 7.41; reverted, 2.21; insoluble, 1.55; total, 11.17; available, 9.62; nitrogen, 1.04; potash, 3.89; chlorine, 1.4; availability of nitrogen, 80. . .

4628 *BRADLEY'S NIAGARA PHOSPHATE*. O. R. Carmen, Wellsburg. *Guarantee*—Phosphoric acid, soluble, 5;



reverted, 2; insoluble, 1; total, 8; available, 7; nitrogen, 0.82; potash, 1; phosphoric acid from dissolved phosphate rock, fish, and tankage; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 3.94; reverted, 3.86; insoluble, 1.27; total, 9.07; available, 7.80; nitrogen, 1.01; potash, 1.24; chlorine, 1.8; availability of nitrogen, 77.

4374 *BRADLEY'S ALKALINE BONE*. O. R. Carmen, Wellsburg. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 8.34; reverted, 2.60; insoluble, 1.00; total, 11.94; available, 10.94; potash, 2.32; chlorine, 1.2; *Remark*—Source of potash equivalent to muriate.

4491 *BRADLEY'S ALKALINE BONE*. J. W. Hedrick, Alderson. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.18; reverted, 5.57; insoluble, 1.03; total, 11.78; available, 10.75; potash, 2.02; chlorine, 2.7.

4646 *BRADLEY'S ALKALINE BONE*. A. P. Russell & Co., Buckhannon. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.58; reverted, 6.10; insoluble, 0.96; total, 12.64; available, 11.68; potash, 2.14; chlorine, 3.1.

4490 *BRADLEY'S SOLUBLE DISSOLVED BONE*. J. W. Hedrick, Alderson. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 10.61; reverted, 4.63; insoluble, 1.72; total, 16.96; available, 15.24.

4629 *BRADLEY'S SOLUBLE DISSOLVED BONE*. O. R. Carmen, Wellsburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 11.51; reverted, 4.38; insoluble, 1.09; total, 16.98; available, 15.89.

4382 *CANTON CHEMICAL POTATO MANURE*. Armstrong, Chrislip & Co., Buckhannon. *Guarantee*—Phosphoric acid, soluble, 4; reverted, 2; insoluble, 1; total, 7; available, 6; nitrogen, 1.23; potash, 5; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from dissolved animal bone, fish, and tankage; potash from kainit and manure salts. *Found*: Phosphoric acid, soluble, 4.25; reverted, 3.00; insoluble, 1.51; total, 8.76; available, 7.25; nitrogen, 1.34; potash, 5.65; chlorine, 1.7; availability of nitrogen, 84.

4413 *CANTON CHEMICAL POTATO MANURE*. Washington & Alexander, Charles Town. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.24; reverted, 4.49; insoluble, 1.46; total, 9.19; available, 7.73; nitrogen, 1.45; potash, 5.24; chlorine, 1.5; availability of nitrogen, 78.

4448 *CANTON CHEMICAL POTATO MANURE*. C. W. Siever, Keyser. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.22; reverted, 3.65; insoluble, 0.96; total, 7.83; available, 6.87; nitrogen, 1.50; potash, 4.85; chlorine, 2.9; availability of nitrogen, 80.

4432 *CANTON CHEMICAL GAME GUANO*. W. L. Cole, Clarksburg. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 1.65; potash, 2; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from dissolved animal bone, fish, and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 7.20; reverted, 3.70; insoluble, 1.69; total, 12.59; available, 10.90; nitrogen, 1.76; potash, 2.01; chlorine, 1.6; availability of nitrogen, 83.

4583 *CANTON CHEMICAL GAME GUANO*. R. P. Floyd, Mannington. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 1.65; potash, 2; phosphoric acid from dissolved phosphate rock and

dissolved animal bone; nitrogen from dissolved animal bone, fish, and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 4.64; reverted 4.59; insoluble, 1.89; total, 11.12; available, 9.23; nitrogen, 1.79; potash, 2.29; chlorine, 3.07; availability of nitrogen, 89.

4380 *CANTON CHEMICAL SPECIAL WHEAT, CORN AND GRASS FERTILIZER*. Armstrong, Chrislip & Co., Buckhannon. *Guarantee*—Phosphoric acid, soluble, 7; reverted, 2; insoluble, 1; total, 10; available, 9; nitrogen, 0.82; potash, 2; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 7.85; reverted, 1.73; insoluble, 1.06; total, 10.64; available, 9.58; nitrogen, 1.03; potash, 2.45; chlorine, 2.3; availability of nitrogen, 80.

4445 *CANTON CHEMICAL SPECIAL WHEAT, CORN AND GRASS FERTILIZER*. C. W. Siever, Keyser. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.92; reverted, 2.29; insoluble, 0.74; total, 9.95; available, 9.21; nitrogen, 1.04; potash, 2.49; chlorine, .44; availability of nitrogen, 75.

4462 *CANTON CHEMICAL SPECIAL WHEAT, CORN AND GRASS FERTILIZER*. W. H. Brady, Berkeley Springs. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8.53; reverted, 0.62; insoluble, 1.51; total, 10.66; available, 9.15; nitrogen, 0.94; potash, 2.07; chlorine, 1.9; availability of nitrogen, 81.

4532 *CANTON CHEMICAL SPECIAL WHEAT, CORN AND GRASS FERTILIZER*. Washington & Alexander, Charles Town. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.06; reverted, 2.63; insoluble, 1.45; total, 11.14; available, 9.69; nitrogen, 0.95; potash, 2.08; chlorine, 2.5; availability of nitrogen, 85.

4557 *CANTON CHEMICAL SPECIAL WHEAT, CORN*

*AND GRASS FERTILIZER.* J. M. Hagerty, Farmington. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.98; reverted, 2.84; insoluble, 2.14; total, 11.96; available, 9.82; nitrogen, 1.17; potash, 2.06; chlorine, 2.5; availability of nitrogen, 81.

4381 *CANTON CHEMICAL HARROW BRAND CROP GROWER.* Armstrong, Chrislip & Co., Buckhannon. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 1; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 8.35; reverted, 1.82; insoluble, 0.91; total, 11.08; available, 10.17; nitrogen, 1.06; potash, 1.40; chlorine, 2.6; availability of nitrogen, 78.

4433 *CANTON CHEMICAL HARROW BRAND CROP GROWER.* W. L. Cole, Clarksburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.38; reverted, 2.62; insoluble, 1.33; total, 11.33; available, 10.00; nitrogen, 0.95; potash, 1.24; chlorine, 2.9; availability of nitrogen, 75.

4446 *CANTON CHEMICAL HARROW BRAND CROP GROWER.* C. W. Siever, Keyser. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.35; reverted, 3.87; insoluble, 0.67; total, 9.89; available, 9.22; nitrogen, 0.96; potash, 1.35; chlorine, 8.2; availability of nitrogen, 85. *Remark*—Chlorine excessive.

4478 *CANTON CHEMICAL HARROW BRAND CROP GROWER.* W. L. Cole, Clarksburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.24; reverted, 5.74; insoluble, 1.87; total, 10.85; available, 8.28; nitrogen, 1.04; potash, 1.21; chlorine, 5.2; availability of nitrogen, 80. *Remark*—Chlorine excessive.

4556 *CANTON CHEMICAL HARROW BRAND CROP*

*GROWER. J. M. Hagerty, Farmington. Guarantee—(As above). Found: Phosphoric acid, soluble, 3.01; reverted, 5.96; insoluble, 1.85; total, 10.82; available, 8.97; nitrogen, 1.05; potash, 1.86; chlorine, 2.9; availability of nitrogen, 86.*

4444 *CANTON CHEMICAL SOLUBLE BONE AND POTASH. C. W. Siever, Keyser. Guarantee—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from dissolved phosphate rock, potash from kainit. Found: Phosphoric acid, soluble, 1.82; reverted, 9.05; insoluble, 1.87; total, 12.74; available, 10.87; potash, 1.99; chlorine, 3.4.*

4392 *CANTON CHEMICAL SOLUBLE BONE AND POTASH. Armstrong, Chrislip & Co., Buckhannon. Guarantee—(As above). Found: Phosphoric acid, soluble, 3.97; reverted, 7.21; insoluble, 1.70; total, 12.83; available, 11.18; potash, 2.40; chlorine, 3.8.*

4480 *CANTON CHEMICAL SOLUBLE BONE AND POTASH. W. L. Cole, Clarksburg. Guarantee—(As above). Found: Phosphoric acid, soluble, 6.65; reverted, 4.05; insoluble, 1.45; total, 12.15; available, 10.70; potash, 1.92; chlorine, 3.4.*

4543 *CANTON CHEMICAL SOLUBLE BONE AND POTASH. C. W. Siever, Keyser. Guarantee—(As above). Found: Phosphoric acid, soluble, 4.45; reverted, 5.58; insoluble, 1.66; total, 11.69; available, 10.03; potash, 1.92; chlorine, 4.00.*

.. 4582 *CANTON CHEMICAL SOLUBLE BONE AND POTASH. R. P. Floyd & Son, Mannington. Guarantee—(As above). Found: Phosphoric acid, soluble, 6.64; reverted, 4.05; insoluble, 1.51; total, 12.20; available, 10.69; potash, 1.82; chlorine, 3.7.*

4383 *CANTON CHEMICAL DISSOLVED S. C. BONE. Armstrong, Chrislip & Co., Buckhannon. Guarantee—Phos-*

phoric acid, soluble, 12.00; reverted, 2.00; insoluble, 1.00; total, 15.00; available, 14.00; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 14.42; reverted, 1.76; insoluble, 0.18; total, 16.36; available, 16.18.

4412 *CANTON CHEMICAL DISSOLVED S. C. BONE.*

Washington & Alexander, Charles Town. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 13.43; reverted, 3.08; insoluble, 0.47; total, 16.98; available, 16.51.

4461 *CANTON CHEMICAL DISSOLVED S. C. BONE.*

W. H. Brady, Berkeley Springs. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 13.56; reverted, 2.99; insoluble, 0.22; total, 16.87; available, 16.65.

4531 *CANTON CHEMICAL DISSOLVED S. C. BONE.*

Washington & Alexander, Charles Town. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 13.15; reverted, 0.34; insoluble, 3.83; total, 17.32; available, 13.49.

4571 *CANTON CHEMICAL DISSOLVED S. C. BONE.*

L. P. Licklider, Martinsburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 12.70; reverted, 3.65; insoluble, 0.32; total, 16.76; available, 16.44.

4415 *CANTON CHEMICAL SOLUBLE ALKALINE*

*BONE.* Washington & Alexander, Charles Town. *Guarantee*—Phosphoric acid, soluble, 10.00; reverted, 2.00; insoluble, 1.00; total, 13.00; available, 12.00; potash, 3.00; phosphoric acid from dissolved phosphate rock, potash from kainit and manure salts. *Found*: Phosphoric acid, soluble, 8.33; reverted, 4.92; insoluble, 0.46; total, 13.71; available, 13.25; potash, 3.04; chlorine, 1.8.

4379 *CLEVELAND DRYER FOREST CITY BUCK-*

*EYE.* Bishop & Barb, Jane Lew. *Guarantee*—Phosphoric acid, soluble, 7.00; reverted, 2.00; insoluble, 1.00; total, 10.00; available, 9.00; nitrogen, 2.47; potash, 2.00; phosphoric acid from dis-

solved phosphate rock and animal bone; nitrogen from dissolved animal bone, blood and azotine; potash from muriate and manure salts. *Found*: Phosphoric acid, soluble, 8.61; reverted, 1.85; insoluble, 1.65; total, 12.11; available, 10.46; nitrogen, 1.73; potash, 2.49; chlorine, 0.8; availability of nitrogen 89.

4399 *CLEVELAND DRYER FOREST CITY BUCK-EYE*. J. W. Feather, Kingwood. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.61; reverted, 3.29; insoluble, 1.45; total, 12.35; available, 10.90; nitrogen, 1.70; potash, 2.21; chlorine, 1.0; availability of nitrogen, 91.

4400 *CLEVELAND DRYER PHOSPHO BONE*. J. W. Feather, Kingwood. *Guarantee*—Phosphoric acid, soluble, 8.00; reverted, 2.00; insoluble, 1.00; total, 11.00; available, 10.00; nitrogen, 0.82; potash, 1.00; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 8.88; reverted, 2.21; insoluble, 1.09; total, 12.18; available, 11.09; nitrogen, 1.12; potash, 1.27; chlorine, 2.9; availability of nitrogen, 84.

4464 *CLEVELAND DRYER PHOSPHO BONE*. J. W. & Jeff Miller, Spencer. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.28; reverted, 3.85; insoluble, 1.78; total, 12.91; available, 11.13; nitrogen, 0.93; potash, 1.16; chlorine, 1.1; availability of nitrogen, 77.

4633 *CLEVELAND DRYER PHOSPHO BONE*. S. J. Taylor, Toll Gate. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8.33; reverted, 3.70; insoluble, 1.38; total, 13.41; available, 12.03; nitrogen, 1.04; potash, 1.16; chlorine, 2.6; availability of nitrogen, 78.

4631 *CLEVELAND DRYER HORSEHEAD PHOSPHATE*. S. J. Taylor, Toll Gate. *Guarantee*—Phosphoric acid, soluble, 8.00; reverted, 2.00; insoluble, 1.00; total, 11.00;

available, 10.00; phosphoric acid from dissolved phosphate rock; *Found*: Phosphoric acid, soluble, 2.32; reverted, 9.26; insoluble, 1.70; total, 13.28; available, 11.58.

4378 CLEVELAND DRYER HORSEHEAD PHOSPHATE WITH POTASH. Bishop & Barb, Jane Lew. *Guarantee*—Phosphoric acid, soluble, 8.00; reverted, 2.00; insoluble, 1.00; total, 11.00; available, 10.00; potash, 2.00; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 9.59; reverted, 2.09; insoluble, 0.42; total, 12.10; available, 11.68; potash, 2.13; chlorine, 2.7.

4398 CLEVELAND DRYER HORSEHEAD PHOSPHATE WITH POTASH. J. W. Feather, Kingwood. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8.02; reverted, 3.06; insoluble, 0.38; total, 11.46; available, 11.08; potash, 2.04; chlorine, 3.0.

4465 CLEVELAND DRYER HORSEHEAD PHOSPHATE WITH POTASH. J. W. & Jeff Miller, Spencer. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.13; reverted, 2.22; insoluble, 1.73; total, 12.19; available, 10.46; potash, 1.62; chlorine, 1.1.

4620 CLEVELAND DRYER HORSEHEAD PHOSPHATE WITH POTASH. Bishop & Barb, Jane Lew. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.27; reverted, 3.05; insoluble, 1.54; total, 10.86; available, 9.32; potash, 2.12; chlorine, 4.00.

4397 CLEVELAND DRYER XXX PHOSPHATE. J. W. Feather,, Kingwood. *Guarantee*—Phosphoric acid, soluble, 12.00; reverted, 2.00; insoluble, 1.00; total, 15.00; available, 14.00; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 13.56; reverted, 2.94; insoluble, 0.26; total, 16.77; available, 16.51.



4632 *CLEVELAND DRYER XXX PHOSPHATE*. S. J. Taylor, Toll Gate. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 10.59; reverted, 6.12; insoluble, 0.82; total, 17.53; available, 16.71.

4436 *DETRICK'S SOLUBLE BONE PHOSPHATE AND POTASH*. Bush & Sleeth, Toll Gate. *Guarantee*—Phosphoric acid, soluble, 8.00; reverted, 2.00; insoluble, 1.00; total, 11.00; available, 10.00; potash, 2.00; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 8.21; reverted, 2.63; insoluble, 0.49; total, 11.33; available, 10.84; potash, 2.12; chloride, 2.7.

4541 *DETRICK'S SOLUBLE BONE PHOSPHATE AND POTASH*. Geo. Brinkman, Grafton. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 4.95; reverted, 5.49; insoluble, 1.06; total, 11.50; available, 10.44; potash, 1.54; chlorine, 4.7.

4595 *DETRICK'S SOLUBLE BONE PHOSPHATE AND POTASH*. H. J. Heck, Barrickville. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.91; reverted, 7.66; insoluble, 1.59; total, 13.16; available, 11.57; potash, 2.44; chlorine, 1.9.

4596 *DETRICK'S KANGAROO COMPLETE COMPOUND*. H. J. Heck, Barrickville. *Guarantee*—Phosphoric acid, soluble, 6.00; reverted, 2.00; insoluble, 1.00; total, 9.00; available, 8.00; nitrogen, 1.65; potash, 3.00; phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved animal bone, fish, and tankage; potash from kainit and manure salts. *Found*: Phosphoric acid, soluble, 5.10; reverted, 6.30; insoluble, 2.57; total, 13.97; available, 11.40; nitrogen, 1.89; potash, 2.83; chlorine, 1.7.

4573 *DETRICK'S DISSOLVED S. C. BONE*. L. P. Lieklider, Martinsburg. *Guarantee*—Phosphoric acid, soluble,

12.00; reverted, 2.00; insoluble, 1.00; total, 15.00; available, 14.00; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 12.32; reverted, 4.29; insoluble, 0.46; total, 17.07; available, 16.61.

4597 *DETRICK'S IMPERIAL COMPOUND*. H. J. Heck, Barrieksville. *Guarantee*—Phosphoric acid, soluble, 6.00; reverted, 2.00; insoluble, 1.00; total, 9.00; available, 8.00; nitrogen, 0.82; potash, 2.00; phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Soluble Phosphoric acid, 5.53; reverted, 3.89; insoluble, 1.80; total, 11.22; available, 9.42; nitrogen, 1.03; potash, 2.39; chlorine, 2.7. Availability of nitrogen, 82.

4485 *GREAT EASTERN UNAMMONIATED WHEAT SPECIAL*. J. M. McIntosh & Son, Ravenswood. *Guarantee*—Phosphoric acid, soluble, 10.00; reverted, 2.00; insoluble, 1.00; total, 13.00; available, 12.00; Phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 8.64; reverted, 3.86; insoluble, 1.99; total, 14.49; available, 12.50.

4613 *GREAT EASTERN UNAMMONIATED WHEAT SPECIAL*. ——— Herring, Kingwood. *Guarantee*—As above. *Found*: Phosphoric acid, soluble, 6.58; reverted, 5.75; insoluble, 3.56; total, 15.89; available, 12.33.

4439 *GREAT EASTERN CORN FERTILIZER*. Alexander Bros., Toll Gate. *Guarantee*—Phosphoric acid, soluble, 6.00; reverted, 2.00; insoluble, 1.00; total, 9.00; available, 8.00; nitrogen, 0.82; potash, 4.00; phosphoric acid from dissolved phosphate rock; nitrogen from fish and tankage; potash from kainit and manure salts. *Found*: Phosphoric acid, soluble, 5.18; reverted, 3.50; insoluble, 0.72; total, 9.40; available, 8.68; nitrogen, 0.97; potash, 3.77; chlorine, 3.00; availability of nitrogen, 82. *Remark*—Source of potash equivalent to kainit.

4624 *GREAT EASTERN CORN FERTILIZER*. Lake & McCarty, Jane Lew. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 4.70; reverted, 3.09; insoluble, 1.55; total, 9.34; available, 7.79; nitrogen, 0.90; potash, 4.33. Chlorine, 3.4; availability of nitrogen, 71. *Remark*—Source of potash equivalent to kainit.

4437 *GREAT EASTERN VEGETABLE, VINE AND TOBACCO*. Allender Bros., Toll Gate. *Guarantee*—Phosphoric acid, soluble, 6.00; reverted, 2.00; insoluble, 1.00; total, 9.00; available, 8.00; nitrogen, 2.06; potash, 3.00; phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved tankage, fish, blood and animal bone; potash from kainit and manure salts. *Found*: Phosphoric acid, soluble, 6.41; reverted, 2.25; insoluble, 0.69; total, 9.35; available, 8.66; nitrogen, 2.35; potash, 2.38; chlorine 3. Availability of nitrogen, 83. *Remark*—Source of potash equivalent to kainit.

4614 *GREAT EASTERN ENGLISH WHEAT GROWER*. — Herring, Kingwood. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 2; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 3.29; reverted, 3.98; insoluble, 0.67; total, 7.94; available, 7.27; nitrogen, 0.83; potash, 2.05; chlorine, 6.8; availability of nitrogen, 73. *Remark*—Chlorine excessive.

4622 *GREAT EASTERN ENGLISH WHEAT GROWER*. Lake & McCarty, Jane Lew. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.67; reverted, 5.18; insoluble, 1.41; total, 10.26; available, 8.85; nitrogen, 0.82; potash, 2.06; chlorine, 3.04; availability of nitrogen, 80.

4623 *GREAT EASTERN SOLUBLE BONE AND POTASH*. Lake & McCarty, Jane Lew. *Guarantee*—Phosphoric

acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 3.28; reverted, 7.57; insoluble, 0.68; total, 11.53; available, 10.85; potash, 1.67; chlorine, 3.4.

4438 *GREAT EASTERN SOLUBLE BONE AND POTASH*. Allender Bros., Toll Gate. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.08; reverted, 3.31; insoluble, 1.96; total, 11.35; available, 9.39; potash, 2.33; chlorine, 3.4.

4612 *GREAT EASTERN DISSOLVED BONE*. —Herring, Kingwood. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 9.95; reverted, 6.28; insoluble, 0.40; total, 16.63; available, 16.23.

4584 *LAZARETTO BONE COMPOUND*. A. G. Chrislip, Philippi. *Guarantee*—Phosphoric acid, soluble, 7; reverted, 2; insoluble, 1; total, 10; available, 9; nitrogen, 1.03; potash, 3; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from dissolved fish and tankage; potash from kainit and manure salts. *Found*—Phosphoric acid, soluble, 8; reverted, 2.11; insoluble, 1.24; total, 11.35; available 10.11; nitrogen, 1.00; potash, 3.39; chlorine, 1.9; availability of nitrogen, 85.

4606 *LAZARETTO BONE COMPOUND*. Shaffer & Brown, Kingwood. *Guarantee*—(As above). *Found*—Phosphoric acid, soluble, 5.74; reverted, 3.79; insoluble, 0.72; total, 10.25; available, 9.53; nitrogen, 1.30; potash, 3.28; chlorine, 1.5; availability of nitrogen, 76.

4648 *LATARETTO AMMONIATED BONE PHOSPHATE*. W. D. Wright, Lawford. *Guarantee*—Phosphoric

acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 2; phosphoric acid from dissolved phosphate rock and dissolved animal bone, nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 4.54; reverted, 4.83; insoluble, 1.66; total, 11.03; available, 9.37; nitrogen, 0.97; potash, 2.16; chlorine, 2.5; availability of nitrogen, 78.

4648 *LAZARETTO AMMONIATED BONE PHOS. PHATE*. F. B. Drummond & Co., Buckhannon. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.48; reverted, 5.68; insoluble, 1.87; total, 11.13; available, 9.26; nitrogen, 1.19; potash, 2.51; chlorine, 3.0; availability of nitrogen, 84.

4610 *LAZARETTO EXCELSIOR* A. A. A. Shaffer & Brown, Kingwood. *Guarantee*—Phosphoric acid, soluble, 5; reverted, 2; insoluble, 1; total, 8; available, 7; nitrogen, 0.82; potash, 1; phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 3.80; reverted, 4.32; insoluble, 0.64; total, 8.76; available, 8.12; nitrogen, 1.17; potash, 2.20; chlorine, 5.5; availability of nitrogen, 77. *Remark*—*Chlorine excessive*.

4607 *LAZARETTO DISSOLVED BONE PHOSPHATE AND POTASH*. Shaffer & Brown, Kingwood. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 7.57; reverted, 5.54; insoluble, 0.74; total, 13.85; available, 13.11; potash, 1.89; chlorine, 2.9.

4585 *LAZARETTO DISSOLVED BONE PHOSPHATE*. A. G. Chrislip, Philippi. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid,

soluble, 12.81; reverted, 3.91; insoluble, 0.78; total, 17.50; available, 16.72.

4605 *LAZARETTO DISSOLVED BONE PHOSPHATE*. Shaffer & Brown, Kingwood. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 12.65; reverted, 4.00; insoluble, 0.91; total, 17.56; available, 16.65.

4586 *LAZARETTO HIGH GRADE DISSOLVED BONE AND POTASH*. A. G. Chrislip, Philippi. *Guarantee*—Phosphoric acid, soluble, 10; reverted, 2; insoluble, 1; total, 13; available, 12; potash, 5; phosphoric acid from dissolved phosphate rock; potash from kainit and double manure salt. *Found*: Phosphoric acid, soluble, 8.24; reverted, 6.43; insoluble, 0.26; total, 14.93; available, 14.67; potash, 2.98; chlorine, 1.6.

4417 *MARYLAND AMMONIATED BONE*. J. L. Woodyard, Pruntytown. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 1.65; potash, 3; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from dissolved animal bone, fish, and tankage; potash from kainit and manure salts. *Found*: Phosphoric acid, soluble, 8.02; reverted, 1.33; insoluble, 3.33; total, 12.68; available, 9.35; nitrogen, 1.79; potash, 3.99; chlorine, 1.4; availability of nitrogen, 83.

4423 *MARYLAND "O. K." AMMONIATED FERTILIZER*. G. W. Harvey, Tunnelton. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 2; phosphoric acid from dissolved rock and dissolved animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 7.22; reverted, 2.17; insoluble, 1.59; total, 10.98; available, 9.39; nitrogen, 1.03; potash, 2.18; chlorine, 2.2; availability of nitrogen, 92.

4419 *MARYLAND TORNADO FERTILIZER*. J. L. Woodyard, Pruntytown. *Guarantee*—Phosphoric acid, soluble,

10; reverted, 2; insoluble 1; total, 13; available, 12; potash, 5; phosphoric acid from dissolved phosphate rock; potash from kainit and manure salts. *Found*: Phosphoric acid, soluble, 8.14; reverted, 6.55; insoluble, 0.50; total, 15.19; available, 14.69; potash, 4.84; chlorine, 1.0. *Remark*—Source of potash equivalent to muriate.

4422 *MARYLAND TORNADO FERTILIZER*. Sent in by O. E. Darnell, Pruntytown. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.77; reverted, 7.94; insoluble, 0.36; total, 15.07; available, 14.71; potash, 5.14; chlorine, 0.9. *Remark*—Source of Potash equivalent to muriate.

4424 *MARYLAND TORNADO FERTILIZER*. G. W. Harvey, Tunnelton. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 11.40; reverted, 3.02; insoluble, 0.24; total, 14.66; available, 14.42; potash, 5.33; chlorine, 0.8. *Remark*—Source of potash equivalent to muriate..

4518 *MARYLAND TORNADO FERTILIZER*. Payne Brothers, Seebert. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.83; reverted, 4.93; insoluble, 0.86; total, 13.62; available, 12.76; potash, 4.85; chlorine, 1.8.

4553 *MARYLAND TORNADO FERTILIZER*. J. L. Woodyard, Pruntytown. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8.15; reverted, 4.22; insoluble, 1.04; total, 13.41; available, 12.37; potash, 5.01; chlorine, 1.6.

4401 *MARYLAND BONO SUPER-PHOSPHATE*. G. T. Hodges, Shepherdstown. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 8.61; reverted, 2.72; insoluble, 0.38; total, 11.71; available, 11.33; potash, 1.83; chlorine, 3.6.

4453 *MARYLAND BONO SUPER-PHOSPHATE..* McKown & Busey, Martinsburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 1.38; reverted, 8.95; insoluble, 1.48; total, 11.71; available, 10.23; potash, 2.43; chlorine, 3.3.

4552 *MARYLAND BONO SUPER-PHOSPHATE..* J. L. Woodyard, Pruntytown. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 4.71; reverted, 6.15; insoluble, 1.32; total, 12.18; available, 10.86; potash, 2.06; chlorine, 2.6.

4418 *MARYLAND DISSOLVED S. C. BONE.* J. L. Woodyard, Pruntytown. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 13.62; reverted, 3.04; insoluble, 0.27; total, 16.93; available, 16.66.

4421 *MARYLAND DISSOLVED S. C. BONE.* G. W. Harvey, Tunnelton. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 13.73; reverted, 3.12; insoluble, 0.31; total, 17.16; available, 16.85.

4452 *MARYLAND DISSOLVED S. C. BONE.* McKown & Busey, Martinsburg. *Guarantee*—(As above). *Found*: Soluble phosphoric acid, 12.20; reverted, 4.15; insoluble, 0.52; total, 16.87; available, 16.35.

4551 *MARYLAND DISSOLVED S. C. BONE.* J. L. Woodyard, Pruntytown. *Guarantee*—(As above). *Found*: Soluble phosphoric acid, 10.84; reverted, 5.23; insoluble, 1.65; total, 17.72; available, 16.07.

4574 *SUSQUEHANNAH XXV PHOSPHATE.* J. H. Miller & Son, Martinsburg. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 1; phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved fish and tankage; pot-



ash from kainit. *Found*: Phosphoric acid, soluble, 4.91; reverted, 3.74; insoluble, 1.60; total, 10.25; available, 8.65; nitrogen, 0.96; potash, 1.28; chlorine, 4.2; availability of nitrogen, 85.

4575 *SUSQUEHANNAH SUPERIOR ROCK PHOSPHATE*. J. H. Miller & Son, Martinsburg. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from phosphate rock. *Found*: Phosphoric acid, soluble, 12.68; reverted, 3.42; insoluble, 1.36; total, 17.46; available, 16.10.

4375 *WILLIAMS & CLARK'S ROYAL BONE PHOSPHATE*. O. R. Carmen, Wellsburg. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 1.03; potash, 2. Phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 6.73; reverted, 2.91; insoluble, 1.87; total, 11.51; available, 9.64; nitrogen, 1.04; potash, 2.46; chlorine, 1.1; availability of nitrogen, 77. *Remark*—*Source of potash equivalent to muriate.*

4514 *WILLIAMS & CLARK'S PROLIFIC CROP PRODUCER*. Lewisburg Milling & Electric Company, Lewisburg. *Guarantee*—Phosphoric acid, soluble, 5; reverted, 2; insoluble, 1; total, 8; available, 7; nitrogen, 0.82; potash, 1; phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 1.60; reverted, 7.02; insoluble, 0.96; total, 9.58; available, 8.62; nitrogen, 1.04; potash, 1.10; chlorine, 5.5; availability of nitrogen, 79. *Remark*—*Chlorine excessive.*

4528 *WILLIAMS & CLARK'S PROLIFIC CROP PRODUCER*. C. Philipps, Belington. *Guarantee*—Phosphoric acid, soluble, 5; reverted, 2; insoluble, 1; total, 8; available, 7; nitrogen, 0.82; potash, 1; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from dissolved fish and

tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 2.11; reverted, 6.65; insoluble, 1.04; total, 9.80; available, 8.76; potash, 1.31; chlorine, 2.9; availability of nitrogen, 88.

4587 *WILLIAMS & CLARK'S PROLIFIC CROP PRODUCER*. A. G. Chrislip, Philippi. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.00; reverted, 3.75; insoluble, 1.59; total, 10.34; available, 8.75; nitrogen, 1.07; potash, 1.30; chlorine, 4.1; availability of nitrogen, 75.

4376 *WILLIAMS & CLARK'S GOOD GROWER POTATO PHOSPHATE*. Bishop & Barbe, Jane Lew. *Guarantee*—Phosphoric acid, soluble, 4; reverted, 2; insoluble, 1; total, 7; available, 6; nitrogen, 1.23; potash, 5; phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved animal bone, fish and tankage; potash from kainit and manure salts. *Found*: Phosphoric acid, soluble, 5.45; reverted, 2.61; insoluble, 1.16; total, 9.22; available, 8.06; nitrogen, 1.37; potash, 5.24; chloride, 1.1; availability of nitrogen, 84. *Remark*—*Source of potash equivalent to mureati*.

4420 *WILLIAMS & CLARK'S DISSOLVED BONE AND POTASH*. G. W. Harvey, Tunnelton. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from dissolved phosphate rock; potash from kainit. *Found*: Phosphoric acid, soluble, 8.70; reverted, 2.56; insoluble, 0.42; total, 11.68; available, 11.26; potash, 1.91; chlorine, 2.9.

4530. *WILLIAMS & CLARK'S DISSOLVED BONE AND POTASH*. C. Philipps, Belington. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.38; reverted, 3.36; insoluble, 0.97; total, 11.71; available, 10.74; potash, 1.86; chlorine, 3.1.

4512 *WILLIAMS & CLARK'S ACORN ACID PHOSPHATE*. Lewisburg Milling and Electric Company, Lewis-

burg. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 12.93; reverted, 4.06; insoluble, 0.27; total, 17.26; available, 16.99.

4562 *WILLIAMS & CLARK'S ACORN ACID PHOSPHATE*. A. G. Chrislip, Philippi. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 12.47; reverted, 4.02; insoluble, 0.84; total, 17.33; available, 16.49.

4410 *ZELL'S SPECIAL COMPOUND FOR POTATOES AND VEGETABLES*. Exchange Mill Company, Grafton. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 2.47; potash, 4; phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved animal bone, blood and azotine; potash from muriate and manure salts. *Found*: Phosphoric acid, soluble, 5.81; reverted, 2.68; insoluble, 1.19; total, 9.68; available, 7.49; nitrogen, 2.35; potash, 4.60; chlorine, 1.4; availability on nitrogen, 86.

4550 *ZELL'S AMMONIATED BONE SUPER-PHOSPHATE*. Exchange Mill Company, Grafton. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 1.65; potash, 2; phosphoric acid from dissolved phosphate rock and dissolved animal bone; nitrogen from dissolved animal bone, blood and azotine; potash from kainit. *Found*: Phosphoric acid, soluble, 3.45; reverted, 5.12; insoluble, 2.29; total, 10.86; available, 8.57; nitrogen, 1.82; potash, 2.13; chlorine, 2.9; availability of nitrogen, 90.

4409 *ZELL'S ECONOMIZER PHOSPHATE*. Exchange Mill Co., Grafton. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 2; phosphoric acid from dissolved phosphate rock and

dissolved animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 7.56; reverted, 2.39; insoluble, 1.82; total, 11.77; available, 9.95; nitrogen, 1.00; potash, 1.99; chlorine, 1.4; availability of nitrogen, 82.

4475 *ZELL'S ECONOMIZER PHOSPHATE*. J. L. Hall, Fairmont. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.35; reverted, 5.48; insoluble, 1.74; total, 10.67; available, 8.83; nitrogen, 1.10; potash, 2.31; chlorine, 2.8; availability of nitrogen, 80.

4548 *ZELL'S ECONOMIZER PHOSPHATE*. Exchange Mill Co., Grafton. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 4.32; reverted, 5.80; insoluble, 0.88; total, 11.00; available, 10.12; nitrogen, 0.98; potash, 2.61; chlorine, 1.9; availability of nitrogen, 85.

4407 *ZELL'S LITTLE GIANT*. Exchange Mill Co., Grafton. *Guarantee*—Phosphoric acid, soluble, 5; reverted, 2; insoluble, 1; total, 8; available, 7; nitrogen, 0.82; potash, 1; phosphoric acid from dissolved phosphate rock and animal bone; nitrogen from dissolved fish and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 6.20; reverted, 2.84; insoluble, 1.46; total, 10.50; available, 9.04; nitrogen, 0.97; potash, 1.27; chlorine, 2.8; availability of nitrogen, 89.

4473 *ZELL'S LITTLE GIANT*. J. L. Hall, Fairmont. *Guarantee*—(As above) *Found*: Phosphoric acid, soluble, 2.61; reverted, 5.77; insoluble, 1.37; total, 9.75; available, 8.38; nitrogen, 1.11; potash, 1.30; chlorine, 4.6; availability of nitrogen, 80. *Remark*—Chlorine excessive.

4411 *ZELL'S ELECTRIC PHOSPHATE*. Exchange Mill Company, Grafton. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from dissolved phosphoric rock; potash from

kainit. *Found*: Phosphoric acid, soluble, 8.46; reverted, 3.09; insoluble, 0.46; total, 11.92; available, 11.46; potash, 2.14; chlorine, 2.5.

4474 *ZELL'S ELECTRIC PHOSPHATE*. J. L. Hall, Fairmont. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.79; reverted, 3.85; insoluble, 1.39; total, 12.03; available, 10.64; potash, 2.19; chlorine, 3.3.

4529 *ZELL'S ELECTRIC PHOSPHATE*. C. Philipps, Belington. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.59; reverted, 4.77; insoluble, 1.45; total, 11.81; available, 10.36; potash, 2.06; chlorine, 3.6.

4549 *ZELL'S ELECTRIC PHOSPHATE*. Exchange Mill Co., Grafton. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.97; reverted, 5.27; insoluble, 0.91; total, 12.15; available, 11.24; potash, 1.95; chlorine, 2.9.

4408 *ZELL'S DISSOLVED BONE PHOSPHATE*. Exchange Mill Co., Grafton. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 13.69; reverted, 2.66; insoluble, 0.55; total, 16.90; available, 16.35.

4403 *ZELL'S DISSOLVED BONE PHOSPHATE*. G. T. Hodges, Shepherdstown. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 13.60; reverted, 3.05; insoluble, 0.28; total, 16.93; available, 16.65.

4476 *ZELL'S DISSOLVED BONE PHOSPHATE*. J. L. Hall, Fairmont. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 12.63; reverted, 3.86; insoluble, 0.46; total, 16.95; available, 16.49.

4493 *ZELL'S DISSOLVED BONE PHOSPHATE*.

Johnson & Gwinn, Alderson. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 11.22; reverted, 4.34; insoluble, 1.71; total, 17.27; available, 15.56.

4527 *ZELL'S DISSOLVED BONE PHOSPHATE*. C. Philipps, Belington. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 11.39; reverted, 5.92; insoluble, 1.66; total, 18.97; available, 17.31.

4547 *ZELL'S DISSOLVED BONE PHOSPHATE*. Exchange Mill Co., Grafton. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 13.09; reverted, 3.54; insoluble, 0.51; total, 17.14; available, 16.63.

4617 *ZELL'S DISSOLVED S. C. PHOSPHATE*. R. Hunter, Berkeley Springs. *Guarantee*—Phosphoric acid, soluble, 10; reverted, 2; insoluble, 1; total, 13; available, 12; phosphoric acid from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 8.09; reverted, 6.08; insoluble, 1.89; total, 16.06; available, 14.17.

#### ABBOTT & MARTIN RENDERING COMPANY.

COLUMBUS, OHIO.

4634 *IDEAL GRAIN GROWER*. A. E. Huddleston, White Sulphur. *Guarantee*—Phosphoric acid, soluble, 4; reverted, 3; total, 9; available, 7; nitrogen, 0.82; potash, 1; phosphoric acid from dissolved bone phosphate; nitrogen from bone tankage, blood and tobacco stem; potash from muriate and tobacco stems. *Found*: Phosphoric acid, soluble, 2.74; reverted, 5.98; insoluble, 1.85; total, 10.57; available, 8.72; nitrogen, 0.88; potash, 0.91, and chlorine, 0.2; availability of nitrogen, 73.

#### ARMOUR FERTILIZER WORKS.

BALTIMORE.

4572 *STAR PHOSPHATE*. L. P. Licklider, Martinsburg. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble,

2; total, 16; available, 14; phosphoric acid from super phosphate. *Found:* Phosphoric acid, soluble, 12.81; reverted, 1.55; insoluble, 0.26; total, 15.62; available, 14.36.

4608 *PHOSPHATE*. W. N. Lemon, Shepherdstown. *Guarantee*—(As above). *Found:* Phosphoric acid, soluble, 13.60; reverted, 1.98; insoluble, 0.14; total, 15.72; available, 15.58.

4598 *GRAIN GROWER*. Mossman Brothers, Huntington. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 2; total, 10; available, 8; nitrogen, 1.65; potash, 2; phosphoric acid from animal bone and super-phosphate; nitrogen from bone, blood and tankage; potash from kainit, muriate and sulphate. *Found:* Phosphoric acid, soluble, 4.34; reverted, 7.54; insoluble, 2.10; total, 13.98; available, 11.88; nitrogen, 1.76; potash, 2.13; chlorine, 1.4; availability of nitrogen, 85. *Remark*—*Source of potash equivalent to muriate.*

## BAUGH & SON'S COMPANY.

### BALTIMORE.

4577 *BAUGH'S CORN GROWER*. W. N. Lemon, Shepherdstown. *Guarantee*—Phosphoric acid, insoluble, 3; total, 11; available, 8; nitrogen, 0.82; potash, 4; phosphoric acid from animal bone and phosphate rock; nitrogen from animal bone and tankage; potash from kainit and muriate. *Found:* Phosphoric acid, soluble, 5.21; reverted, 4.58; insoluble, 2.29; total, 12.08; available, 9.79; nitrogen, 0.82; potash, 5.47; chlorine, 1.4; availability of nitrogen, 73.

4429 *BAUGH'S SPECIAL POTATO MANURE*. R. T. Lowndes, Clarksburg. *Guarantee*—Phosphoric acid, insoluble, 2; total, 7; available, 5; nitrogen, 1.64; potash, 10; phosphoric acid from animal bone and phosphate rock; nitrogen from animal bone and tankage; potash from high grade sulphate, muri-

ate and kainit. *Found*: Phosphoric acid, soluble, 4.43; reverted, 1.99; insoluble, 1.14; total, 7.56; available, 6.42; nitrogen, 1.78; potash, 10.22; chlorine, 0.7; availability of nitrogen, 85.

4430 *BAUGH'S WARRANTED PURE BONE MEAL*. R. T. Lowndes, Clarksburg. *Guarantee*—Total phosphoric acid, 21.50; nitrogen, 3.49; phosphate acid from animal bones; nitrogen from animal bones. *Found*: Total phosphoric acid, 21.84; nitrogen, 3.96; availability of nitrogen, 81.

4484 *BAUGH'S WARRANTED PURE BONE MEAL*. R. T. Lowndes, Clarksburg. *Guarantee*—(As above). *Found*: Total phosphoric acid, 23.56; nitrogen, 3.85; availability of nitrogen, 76.

4568 *BAUGH'S WARRANTED PURE BONE MEAL*. J. H. Philipps' Sons, Berkeley Springs. *Guarantee*—(As above). *Found*—Total phosphoric acid, 21.57; nitrogen, 3.77; availability of nitrogen, 73.

4431 *BAUGH'S DOUBLE EAGLE PHOSPHATE*. R. T. Lowndes, Clarksburg. *Guarantee*—Phosphoric acid, insoluble, 3; total, 11; available, 8; nitrogen, 1.64; potash, 1; phosphoric acid from dissolved animal bone and phosphate rock; nitrogen from animal bones and tankage; potash from kainit. *Found*: Phosphoric acid, soluble, 5.53; reverted, 3.96; insoluble, 2.14; total, 11.63; available, 9.49; nitrogen, 1.96; potash, 1.30; chlorine, 2.8; availability of nitrogen, 80.

4460 *BAUGH'S DOUBLE EAGLE PHOSPHATE*. Henshaw & Lieklider, Martinsburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.33; reverted, 3.70; insoluble, 2.05; total, 11.08; available, 9.03; nitrogen, 1.88; potash, 2.17; chlorine, 26; availability of nitrogen, 81.

4481 *BAUGH'S DOUBLE EAGLE PHOSPHATE*. R. T. Lowndes, Clarksburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.21; reverted, 2.86; insoluble, 2.84; total, 2.17; chlorine, 2.6; availability of nitrogen, 81.



4567 *BAUGH'S DOUBLE EAGLE PHOSPHATE*. J. H. Philipps' Sons, Berkeley Springs. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.38; reverted, 5.32; insoluble, 2.35; total, 11.05; available, 8.70; nitrogen, 1.76; potash, 1.57; chlorine, 2.4; availability of nitrogen, 87. *Remark*—*Nitrate of soda found, but not guaranteed.*

4542 *BAUGH'S DOUBLE EAGLE PHOSPHATE*. Offutt & Lakin, Terra Alta. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.26; reverted, 5.32; insoluble, 2.43; total, 11.01; available, 8.68; nitrogen, 1.64; potash, 1.39; chlorine, 2.6; availability of nitrogen, 91. *Remark*—*Nitrate of soda found, though not guaranteed.*

4428 *BAUGH'S GENERAL CROP GROWER*. R. T. Lowndes, Clarksburg. *Guarantee*—Phosphoric acid, insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 1; phosphoric acid from animal bone and phosphate rock; nitrogen from tankage and animal bone; potash from kainit. *Found*: Phosphoric acid, soluble, 6.19; reverted, 2.86; insoluble, 1.84; total, 10.89; available, 9.05; nitrogen, 1.52; potash, 1.65; chlorine, 2.6; availability of nitrogen, 66. *Remark*—*Availability of nitrogenous material low.*

4459 *BAUGH'S GENERAL CROP GROWER*. Henshaw and Licklider, Martinsburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.51; reverted, 2.24; insoluble, 1.57; total, 10.32; available, 8.75; nitrogen, 1.03; potash, 1.48; chlorine, 5.1; availability of nitrogen, 66. *Remark*—*Chlorine excessive. Availability of nitrogenous material low.*

4482 *BAUGH'S GENERAL CROP GROWER*. R. T. Lowndes, Clarksburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.39; reverted, 2.85; insoluble, 2.66; total, 10.90; available, 8.24; nitrogen, 1.32; potash, 1.24; chlorine, 4.6; availability of nitrogen, 60. *Remark*—*Chlorine excessive. Availability of nitrogenous material low.*

4578 *BAUGH'S GENERAL CROP GROWER*. W. N. Lemon, Shepherdstown. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.45; reverted, 1.75; insoluble, 1.87; total, 10.07; available, 8.20; nitrogen, 0.94; potash, 1.53; chlorine, 4.3; availability of nitrogen, 80.

4483 *BAUGH'S WHEAT FERTILIZER*.. R. T. Lownes, Clarksburg. *Guarantee*—Phosphoric acid, insoluble, 3; total, 11; available, 8; nitrogen, 1.64; potash, 2; phosphoric acid from animal bones and phosphate rock; nitrogen from animal bone and tankage; potash from kainit and muriate. *Found*: Phosphoric acid, soluble, 5.35; reverted, 3.23; insoluble, 2.58; total, 11.16; available, 8.58; nitrogen, 1.93; potash, 2; chlorine, 32; availability of nitrogen, 84. *Remark*—*Source of potash equivalent to kainit*.

4513 *BAUGH'S HIGH GRADE ACID PHOSPHATE*. L. W. Conway, Laurel Point; sent in by Josephus Jones. *Guarantee*—Phosphoric acid, available, 14; phosphoric acid from phosphate rock. *Found*: Phosphoric acid, soluble, 12.41; reverted, 3.30; insoluble, 1.85; total, 17.56; available, 15.71.

4570 *BAUGH'S HIGH GRADE ACID PHOSPHATE*. A. R. Unger, Berkeley Springs. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8.70; reverted, 7.71; insoluble, 3.47; total, 19.88; available, 16.41.

4579 *BAUGH'S HIGH GRADE ACID PHOSPHATE*. W. N. Lemon, Shepherdstown. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 2.83; reverted, 15.60; insoluble, 1.39; total, 19.82; available, 18.43.

#### BOWKER FERTILIZER COMPANY.

BOSTON, MASS.

4386 *BOWKER'S HARVEST BONE*. Drummond & Company, Buckhannon. *Guarantee*—Phosphoric acid, total, 10;

available, 8; nitrogen, 0.75; potash, 1; phosphoric acid from dissolved animal bone and dissolved mineral phosphate; nitrogen from dissolved bone and tankage; potash from kainit and muriate. *Found*: Phosphoric acid, soluble, 3.03; reverted, 8.00; insoluble, 3.85; total, 14.88; available, 11.03; nitrogen, 0.90; potash, 1.87; chlorine, 1.6; availability of nitrogen, 78.

4504 *BOWKER'S HARVEST BONE*. J. M. Miller & Brother, Ronceverte. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 0.82; reverted, 7.62; insoluble, 3.98; total, 12.42; available, 8.44; nitrogen, 0.83; potash, 1.26; chlorine, 1.7; availability of nitrogen, 75.

4520 *BOWKER'S HARVEST BONE*. Payne Brothers, Seebert. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 1.52; reverted, 7.52; insoluble, 3.70; total, 12.74; available, 9.04; nitrogen, 0.91; potash, 1.26; chlorine, 2.3; availability of nitrogen, 82.

4385 *BOWKER'S DISSOLVED BONE*. Drummond & Company, Buckhannon. *Guarantee*—Total phosphoric acid, 11; available, 10; phosphoric acid from dissolved mineral phosphate. *Found*: Phosphoric acid, soluble, 1.57; reverted, 9.78; insoluble, 2.35; total, 13.60; available, 11.25.

4503 *BOWKER'S DISSOLVED BONE*. J. M. Miller & Brother, Ronceverte. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 0.99; reverted, 9.73; insoluble, 3.84; total, 14.56; available, 10.72.

4384 *BOWKER'S DISSOLVED BONE WITH POTASH*. Drummond & Company, Buckhannon. *Guarantee*—Phosphoric acid, total, 11; available, 10; potash, 1; phosphoric acid from dissolved mineral phosphates; potash from kainit and muriate. *Found*: Phosphoric acid, soluble, 2.11; reverted, 8.75; insoluble, 2.21; total, 13.07; available, 10.86; potash, 1.07; chlorine, 2.4.

4388 *BOWKER'S DISSOLVED BONE WITH POTASH* Mason & Watson, Kingwood. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 1.45; reverted, 9.15; insoluble, 2.28; total, 12.88; available, 10.70; potash, 1.05; chlorine, 1.9.

4505 *BOWKER'S DISSOLVED BONE WITH POTASH* J. M. Miller & Brother, Roneeverte. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 0.82; reverted, 9.40; insoluble, 3.67; total, 13.89; available, 10.22; potash, 1.20; chlorine, 1.7.

4521 *BOWKER'S DISSOLVED BONE WITH POTASH* Payne Brothers, Seebert. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 0.99; reverted, 9.99; insoluble, 2.47; total, 13.45; available, 10.98; potash, 1.07; chlorine, 2.9. *Remark*—*Source of potash equivalent to kainit.*

4387 *BOWKER'S SOLUBLE BONE*. Mason & Watson, Kingwood. *Guarantee*—Phosphoric acid, total, 15; available, 14; phosphoric acid from dissolved mineral phosphates. *Found*: Phosphoric acid, soluble, 9.52; reverted, 5.04; insoluble, 3.61; total, 18.17; available, 14.56.

4643 *BOWKER'S BONE MEAL*. A. E. Huddleston, White Sulphur. *Guarantee*—Phosphoric acid, total, 20; nitrogen, 1.50; phosphoric acid from ground animal bone; nitrogen from ground animal bone. *Found*: Total phosphoric acid, 22.41; nitrogen, 1.91; availability of nitrogen, 90.

## THE CINCINNATI PHOSPHATE COMPANY.

CINCINNATI, OHIO.

4599 *CAPITOL WHEAT GROWER*. Williamson & Varner, St. Marys. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from mineral phosphate: *Found*: Phosphoric acid, soluble, 30; reverted, 4.95; insoluble, 4.29; total, 18.54; available, 14.25.

4593 *CAPITOL GRAIN AND GRASS GROWER*.

Shanklin Brothers, Lowell. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; nitrogen, 0.80; potash, 1; phosphoric acid from animal tankage bone and mineral phosphates; nitrogen from animal tankage; potash from muriate. *Found*: Phosphoric acid, soluble, 7.75; reverted, 5.36; insoluble, 1.24; total, 14.35; available, 13.12; nitrogen, 0.91; potash, 1.58; chlorine, 1.5; availability of nitrogen, 78.

4594 *CAPITOL SUPER-PHOSPHATE*. Shanklin Brothers, Lowell. *Guarantee*—Phosphoric acid, soluble, 10; reverted, 2; insoluble, 1; total, 13; available, 12; phosphoric acid from mineral phosphate. *Found*: Phosphoric acid, soluble, 9.94; reverted, 5.11; insoluble, 1.13; total, 16.18; available, 15.05.

#### JARECHI CHEMICAL COMPANY.

SANDUSKY, OHIO.

4336 *NUMBER ONE FISH GUANO*. W. F. Sill, Pennsboro. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; nitrogen, 0.86; potash, 1; phosphoric acid from bone black, phosphate and fish tankage; nitrogen from fish and animal tankage; potash from muriate. *Found*: Phosphoric acid, soluble, 8; reverted, 3.61; insoluble, 1.68; total, 13.29; available, 11.61; nitrogen, 0.79; potash, 1.26; chlorine, 1.7; availability of nitrogen, 78. *Remark*—Source of potash from low grade muriate.

4500 *NUMBER ONE FISH GUANO*. J. S. Burdette, Alderson. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.64; reverted, 5.28; insoluble, 1.28; total, 13.20; available, 11.92; nitrogen, 0.83; potash, 1.34; chlorine, 1.00; availability of nitrogen, 80.

4559 *NUMBER ONE FISH GUANO*. J. M. Hagerty, Farmington. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.57; reverted, 3.77; insoluble, 2.94; total, 14.28; availa-

ble, 11.34; nitrogen, 0.81; potash, 1.19; chlorine, 0.2; availability of nitrogen, 83.

4366 *C. O. D. PHOSPHATE*. W. S. Stout, Harrisville. *Guarantee*—Phosphoric acid, soluble, 11; reverted, 3; insoluble, 1; total, 15; available, 14; phosphoric acid from mineral phosphate. *Found*: phosphoric acid, soluble, 10.38; reverted, 3.69; insoluble, 2; total, 16.07; available, 14.07.

4435 *C. O. D. PHOSPHATE*. O. P. Cox & Son, Toll Gate. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 9.91; reverted, 5.26; insoluble, 1.45; total, 16.62; available, 15.17.

4497 *C. O. D. PHOSPHATE*. J. S. Burdette, Alderson. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8.16; reverted, 5.90; insoluble, 2.69; total, 16.75; available, 14.06.

4560 *C. O. D. PHOSPHATE*. J. M. Hagerty, Farmington. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 9.03; reverted, 5.18; insoluble, 3.15; total, 17.36; available, 14.21.

4364 *GROUND BONE*. W. S. Stout, Harrisville. *Guarantee*—Phosphoric acid, total, 20; nitrogen, 2.50; phosphoric acid from bone; nitrogen from bone. *Found*: Phosphoric acid, total, 24.97; nitrogen, 2.85; availability of nitrogen, 81.

4499 *GROUND BONE*. J. S. Burdette, Alderson. *Guarantee*—(As above). *Found*: Phosphoric acid, total, 20.05; nitrogen, 2.15; availability of nitrogen, 87.

4498 *DISSOLVED BONE WITH POTASH*. J. S. Burdette, Alderson. *Guarantee*—Phosphoric acid, soluble, 10; reverted, 2; insoluble, 1; total, 13; available, 12; potash 3; phosphoric acid from mineral phosphates with bone; potash from carbonate and muriate. *Found*: Phosphoric acid, soluble, 7.87; reverted, 5.14; insoluble, 4.25; total, 17.26; available, 13.01; potash, 1.76; chlorine, 0.2.

4363 *FISH AND POTASH POTATO AND TOBACCO FOOD.* W. S. Stout, Harrisville. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 0.86; potash, 4; phosphoric acid from bone black, mineral phosphates, fish and animal tankage; nitrogen from fish tankage and animal tankage; potash from carbonate and muriate. *Found:* Phosphoric acid, soluble, 5.10; reverted, 4.93; insoluble, 1.77; total, 11.80; available, 10.13; nitrogen, 0.98; potash, 3.81; chlorine, 0.4; availability of nitrogen, 82.

4369 *FISH AND POTASH, POTATO AND TOBACCO FOOD.* W. F. Sill, Pennsboro. *Guarantee*—(As above). *Found:* Phosphoric acid, soluble, 6.69; reverted, 3.53; insoluble, 1.59; total, 11.71; available, 10.12; nitrogen, 0.85; potash, 3.56; chlorine, 0.4; availability of nitrogen, 80.

4496 *FISH AND POTASH, POTATO AND TOBACCO FOOD.* H. C. Bare Hardware Company, Alderson. *Guarantee*—(As above). *Found:* Phosphoric acid, soluble, 4.64; reverted, 5.72; insoluble, 1.28; total, 11.64; available, 10.36; nitrogen, 1.07; potash, 3.61; chlorine, 0.5; availability of nitrogen, 82.

4368 *ST. BERNARD PHOSPHATE.* W. F. Sill, Pennsboro. *Guarantee*—Phosphoric acid, soluble, 10; reverted, 2; insoluble, 1; total, 13; available, 12; phosphoric acid from mineral phosphate. *Found:* Phosphoric acid, soluble, 10.06; reverted, 3.54; insoluble, 1.59; total, 15.19; available, 13.60.

4494 *ST. BERNARD PHOSPHATE.* H. C. Bare Hardware Company, Alderson. *Guarantee*—(As above). *Found:* Phosphoric acid, soluble, 6.69; reverted, 6.85; insoluble, 1.94; total, 15.48; available, 13.54.

4495 *PHOSPHATE AND POTASH.* H. C. Bare Hardware Company, Alderson. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from mineral phosphates; potash from muri-

ate. *Found*. Phosphoric acid, soluble, 2.34; reverted, 6.60; insoluble, 1.96; total, 10.90; available, 8.94; potash, 2.13; chlorine, 1.0.

4502 *PHOSPHATE AND POTASH*. J. S. Burdette, Ronceverte. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.05; reverted, 6.99; insoluble, 1.87; total, 13.91; available, 12.04; potash, 1.47; chlorine, 0.8.

4558 *PHOSPHATE AND POTASH*. J. M. Hagerty, Farmington. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.73; reverted, 5.41; insoluble, 3.93; total, 15.07; available, 11.14; potash, 1.57; chlorine, 0.1.

4501 “*SQUARE*” *BRAND PHOSPHATE AND POTASH*. J. S. Burdette, Alderson. *Remark*—No brand bearing precisely this name was registered. *Found*: Phosphoric acid, soluble, 6.98; reverted, 4.82; insoluble, 3.40; total, 15.20; available, 11.80; potash, 1.83; chlorine, 0.2.

## MARIETTA BONE & PHOSPHATE COMPANY.

MARIETTA, OHIO.

4362 “*HORSE*” *BRAND POTATO AND TRUCK SPECIAL*. C. H. Becker, Wheeling. *Guarantee*—Phosphoric acid, soluble, 5; reverted, 3; insoluble, 1; total, 9; available, 8; nitrogen, 3; potash, 5.50; phosphoric acid from bone and acid phosphate; nitrogen from bone, flesh, blood and nitrate of soda; potash from sulphate muriate and kainit. *Found*: Phosphoric acid, soluble, 0.95; reverted, 4.79; insoluble, 1.24; total, 6.98; available, 5.74; nitrogen, 2.78; potash, 4.32; chlorine, 1.2; availability of nitrogen, 91. *Remark*—Source of potash equivalent to muriate.

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4647 “*HORSE*” *BRAND ACID PHOSPHATE*. R. A. Johnson, Parkersburg. *Guarantee*—Phosphoric acid, insoluble, 2; total, 14; available, 12; phosphoric acid from S. C. rock.



*Found:* Phosphoric acid, soluble, 0.96; reverted, 11.88; insoluble, 2.64; total, 15.48; available, 12.84.

G. OBER & SONS' COMPANY.

BALTIMORE, MD.

4389 *OBER'S FARMERS STANDARD AMMONIATED PHOSPHATE*. J. M. Graham, Kingwood. *Guarantee*—Phosphoric acid, soluble, 7; reverted, 2; insoluble, 2; total, 11; available, 9; nitrogen, 1.64; potash, 2; phosphoric acid from high grade Florida phosphate, bone tankage and fish; nitrogen from high grade bone and blood tankage, and fish; potash from sulphate of potash. *Found:* Phosphoric acid, soluble, 8.96; reverted, 2.11; insoluble, 1.39; total, 12.36; available, 10.97; nitrogen, 1.83; potash, 2.20; chlorine, 2.6; availability of nitrogen, 86. *Remark*—Source of potash not as guaranteed; is equivalent to kainit.

4471 *OBER'S FARMERS STANDARD AMMONIATED PHOSPHATE*. Cast and Holden, Clarksburg. *Guarantee*—(As above). *Found:* Phosphoric acid, soluble, 8.72; reverted, 2.02; insoluble, 1.14; total, 11.88; available, 10.74; nitrogen, 1.69; potash, 2.29; chlorine, 2.8; availability of nitrogen, 88. *Remark*—Source of potash equivalent to kainit.

4592 *OHI OF FARMERS' STANDARD AMMONIATED PHOSPHATE*. A. G. Chrislip, Philippi. *Guarantee*—(As above). *Found:* Phosphoric acid, soluble, 9.20; reverted, 2.21; insoluble, 1.84; total, 13.25; available, 11.41; nitrogen, 1.95; potash, 2.36; chlorine, 2.4; availability of nitrogen, 87. *Remark*—Source of potash equivalent to kainit.

4390 *OBER'S FARMERS MIXTURE*. J. M. Graham, Kingwood. *Guarantee*—Phosphoric acid, soluble, 7; reverted, 2; insoluble, 2; total, 11; available, 9; nitrogen, 0.82; potash, 2; phosphoric acid from high grade Florida phosphate, bone tankage and fish; nitrogen from high grade bone, blood tankage and

fish; potash from sulphate of potash. *Found*: Phosphoric acid, soluble, 8.90; reverted, 2.04; insoluble, 1.52; total, 12.46; available, 10.94; nitrogen, 0.90; potash, 2.53; chlorine, 1.1; availability of nitrogen, 75. *Remark*—*Source of potash equivalent to muriate.*

4472 *OBER'S FARMERS MIXTURE*. Cast and Holden, Clarksburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8; reverted, 2.57; insoluble, 1.92; total, 12.49; available, 10.57; nitrogen, 1.19; potash, 2.80; chlorine, 0.9; availability of nitrogen, 88. *Remark*—*Source of potash equivalent to muriate.*

4477 *OBER'S FARMERS MIXTURE*. J. J. Chisler, Fairmont. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8.29; reverted, 2.52; insoluble, 1.82; total, 12.63; available, 10.81; nitrogen, 1.17; potash, 2.73; chlorine, 0.9; availability of nitrogen, 82. *Remark*—*Source of potash equivalent to muriate.*

4590 *OBER'S FARMERS MIXTURE*. A. G. Chrislip, Philippi. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8.17; reverted, 3.26; insoluble, 2.57; total, 14.00; available, 11.43; nitrogen, 1.14; potash, 2.27; chlorine, 2.1; availability of nitrogen, 86. *Remark*—*Source of potash equivalent to low grade muriate.*

4393 *OBER'S DISSOLVED BONE PHOSPHATE AND POTASH*. J. H. Graham, Kingwood. *Guarantee*—Phosphoric acid, soluble, 9; reverted, 2; insoluble, 2; total, 13; available, 11; potash, 2; phosphoric acid from high grade Florida phosphate; potash from sulphate and muriate. *Found*: Phosphoric acid, soluble, 10.73; reverted, 1.33; insoluble, 0.77; total, 12.83; available, 12.06; potash, 3.25; chlorine, 1.1. *Remark*—*Source of potash equivalent to muriate.*

4591 *OBER'S DISSOLVED BONE PHOSPHATE AND*

*POTASH.* A. G. Chrislip, Philippi. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 9.90; reverted, 3.10; insoluble, 3.06; total, 16.06; available, 13.00; potash, 2.04; chlorine, 2.1. *Remark*—*Source of potash equivalent to low grade muriate.*

4618 *OBER'S DISSOLVED BONE PHOSPHATE AND POTASH.* G. B. Roby, Keyser. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 8.78; reverted, 3.84; insoluble, 3.08; total, 15.70; available, 12.62; potash, 1.98; chlorine, 1.2. *Remark*—*Source of potash equivalent to muriate.*

4391 *OBER'S DISSOLVED BONE PHOSPHATE.* J. M. Graham, Kingwood. *Guarantee*—Phosphoric acid, soluble, 11; reverted, 3; insoluble, 2; total, 16; available, 14; phosphoric acid from high grade Florida phosphate. *Found*: Phosphoric acid, soluble, 12.65; reverted, 1.87; insoluble, 1.02; total, 15.54; available, 14.52.

4580 *OBER'S DISSOLVED BONE PHOSPHATE.* Sencindiver & Stewart, Martinsburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 13.24; reverted, 4.25; insoluble, 0.75; total, 18.24; available, 17.49.

4619 *OBER'S DISSOLVED BONE PHOSPHATE.* G. B. Roby, Keyser. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 15.17; reverted, 2.60; insoluble, 0.58; total, 18.35; available, 17.77.

4526 *OBER'S HIGH GRADE ACID PHOSPHATE.* Sent in for analysis by J. B. Huyett, Wheatland. *Guarantee*—Phosphoric acid, soluble, 14.50; reverted, 1.50; insoluble, 1; total, 17; available, 16; phosphoric acid from high grade Florida phosphate. *Found*: Phosphoric acid, soluble, 15.61; reverted, 1.84; insoluble, 0.27; total, 17.72; available, 17.45.

4581 *S. & S. SPECIAL WHEAT COMPOUND.* Sencin-

diver & Stewart, Martinsburg. *Guarantee*—Phosphoric acid, soluble, 7; reverted, 2; insoluble, 2; total, 11; available, 9; nitrogen, 0.82; potash, 2; phosphoric acid from high grade Florida phosphate, bone tankage, and fish; potash from sulphate of potash; nitrogen from high grade bone, blood tankage, and fish. *Found*: Phosphoric acid, soluble, 7.84; reverted, 2.62; insoluble, 2.70; total, 13.16; available, 10.46; nitrogen, 1.04; potash, 2.11; chlorine, 2.00; availability of nitrogen, 88. *Remark*—*Source of potash equivalent to low grade muriate.*

## OHIO FARMERS FERTILIZER COMPANY.

COLUMBUS, OHIO.

4426 *CORN, OATS AND WHEAT, FISH GUANO.* Harry Johnson, Clarksburg. *Guarantee*—Phosphoric acid, soluble, 5; reverted, 3; total, 10; available, 8; nitrogen, 1.23; potash, 2; phosphoric acid from dissolved bone phosphate; nitrogen, two-eighths from blood; two-eighths from fish scrap; three-eighths from bone tankage; one-eighth from tobacco stems; potash, one-fourth from tobacco stems; three-fourths from muriate. *Found*: Phosphoric acid, soluble, 5.18; reverted, 4.21; insoluble, 1.24; total, 10.63; available, 9.39; nitrogen, 1.37; potash, 1.91; chlorine, 1.00; availability of nitrogen, 79.

4642 *CORN, OATS AND WHEAT FISH GUANO.* Spencer Milling Company, Spencer. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 2.07; reverted, 7.09; insoluble, 2.55; total, 11.71; available, 9.16; nitrogen, 1.23; potash, 2.53; chlorine, 0.8; availability of nitrogen, 86.

4427 *GENERAL CROP FISH GUANO.* Harry Johnson, Clarksburg. *Guarantee*—Phosphoric acid, soluble, 4; reverted, 3; total, 9; available, 7; nitrogen, 0.82; potash, 1; phosphoric acid from dissolved bone phosphate; nitrogen, two-eighths from blood; two-eighths from fish scrap; three-eighths from bone tankage; one-eighth from tobacco stems; potash, one-fourth

from tobacco stems; three fourths from muriate. *Found*: Phosphoric acid, soluble, 2.60; reverted, 5.78; insoluble, 1.29; total, 9.67; available, 8.38; nitrogen, 1.03; potash, 0.91; chlorine, 1.8; availability of nitrogen, 78. *Remark*—*Source of potash equivalent to low grade muriate.*

4641 *GENERAL CROP FISH GUANO.* Spencer Milling Company, Spencer. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 1.85; reverted, 5.90; insoluble, 2.70; total, 10.45; available, 7.75; nitrogen, 1.08; potash, 1.24; chlorine, 0.2; availability of nitrogen, 77.

4554 *WHEAT MAKER AND SEEDING DOWN.* W. H. Bailey, Morgantown. *Guarantee*—Phosphoric acid, soluble, 5; reverted, 3; total, 10; available, 8; nitrogen, 0.41; potash, 2.50; phosphoric acid from dissolved bone phosphate; nitrogen, two-eighths from blood; five-eighths from bone tankage; one-eighth from tobacco stems; potash, one-fourth from tobacco stems; three-fourths from muriate. *Found*: Phosphoric acid, soluble, 2.99; reverted, 5.51; insoluble, 1.89; total, 10.39; available, 8.50; nitrogen, 0.67; potash, 2.83; chlorine, 1.6; availability of nitrogen, 78. *Remark*—*Source of potash equivalent to low grade muriate.*

4425 *ACID PHOSPHATE.* Harry Johnson, Clarksburg. *Guarantee*—Phosphoric acid, total, 10; available, 9; phosphoric acid from phosphate rock. *Found*: Phosphoric acid, soluble, 8.62; reverted, 6.36; insoluble, 1.32; total, 16.30; available, 14.98.

4555 *SOLUBLE BONE AND POTASH.* W. H. Bailey, Morgantown. *Guarantee*—Phosphoric acid, soluble, 5; reverted, 3; total, 9; available, 8; potash, 2; phosphoric acid from phosphate rock; potash from muriate. *Found*: Phosphoric acid, soluble, 1.36; reverted, 9.67; insoluble, 1.20; total, 12.23; available, 11.03; potash, 2.25; chlorine, 0.8.

4640 *SOLUBLE BONE AND POTASH.* Spencer Milling Company, Spencer. *Guarantee*—(As above). *Found*:

Phosphoric acid, soluble, 0.97; reverted, 8.55; insoluble, 3.54; total, 13.06; available, 9.52; potash, 2.01; chlorine, 1.0.

PIEDMONT MT. AIRY GUANO COMPANY.

BALTIMORE, MD.

4470 *PIEDMONT PURE RAW BONE MIXTURE.*

James Hawker, Mannington. *Guarantee*—Phosphoric acid, insoluble, 4; total, 12; available, 8; nitrogen, 1.02; potash, 1.50; phosphoric acid from bone tankage; nitrogen from bone tankage; potash from muriate and kainit. *Found*: Phosphoric acid, soluble, 1.48; reverted, 6.81; insoluble, 3.94; total, 12.23; available, 8.29; nitrogen, 1.07; potash, 1.68; chlorine, 2.8; availability of nitrogen, 64. *Remark*—*Source of potash equivalent to kainit. Availability of nitrogen low.*

4469 *PIEDMONT FARMERS HIGH GRADE BONE*

*AND POTASH.* James Hawker, Mannington. *Guarantee*—Phosphoric acid, insoluble, 2; total, 12; available, 10; potash, 2; phosphoric acid from S. C. rock; potash from kainit. *Found*: Phosphoric acid, soluble, 4.38; reverted, 6.08; insoluble, 1.45; total, 11.91; available, 10.46; potash, 2.34; chlorine, 3.2.

R. H. POLLOCK.

BALTIMORE, MD.

4535 *POLLOCK'S DISSOLVED S. C. BONE.*

Washington & Alexander, Charles Town. *Guarantee*—Phosphoric acid, insoluble, 1; total, 15; available, 14; phosphoric acid from S. C. rock. *Found*: Phosphoric acid, soluble, 2.06; reverted, 9.21; insoluble, 1.52; total, 12.79; available, 11.27.

4536 *POLLOCK'S VICTOR BONE PHOSPHATE.*

Washington & Alexander, Charles Town. *Guarantee*—Phosphoric acid, insoluble, 1; total, 10; available, 9; potash, 1; phosphoric acid from S. C. rock; potash from kainit. *Found*: Phos-

phoric acid, soluble, 8.02; reverted, 5.86; insoluble, 3.47; total, 17.35; available, 13.88; potash, 0.60; chlorine, 3.1.

### POWHATAN CHEMICAL COMPANY.

RICHMOND, VIRGINIA.

4515 *MAGIC WHEAT GROWER*. Lewisburg Milling & Electric Company, Lewisburg. *Guarantee*—Phosphoric acid, soluble, 5; reverted, 3; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 2; phosphoric acid from mineral phosphate and tankage; nitrogen from tankage, blood and nitrate of soda; potash from muriate. *Found*: Phosphoric acid, soluble, 3.19; reverted, 6.38; insoluble, 1.33; total, 10.90; available, 9.57; nitrogen, 0.82; potash, 1.55; chlorine, 1.1; availability of nitrogen, 86.

4516 *BONE AND POTASH MIXTURE*. Lewisburg Milling and Electric Co., Lewisburg. *Guarantee*—Phosphoric acid, soluble, 7; reverted, 3; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from mineral phosphate; potash from sulphate of potash. *Found*: Phosphoric acid, soluble, 3.72; reverted, 7.23; insoluble, 1.96; total, 12.91; available, 10.95; potash, 2.20; chlorine, 0.9. *Remark*—*Source of potash equivalent to muriate; sulphate guaranteed.*

4517 *HIGH GRADE ACID PHOSPHATE*. Lewisburg Milling and Electric Co., Lewisburg. *Guarantee*—Phosphoric acid, soluble, 10; reverted, 4; insoluble, 1; total, 15; available, 14; phosphoric acid from mineral phosphates. *Found*: Phosphoric acid, soluble, 7.55; reverted, 8.10; insoluble, 0.67; total, 16.32; available, 15.65.

### RASIN MONUMENTAL COMPANY.

BALTIMORE, MD.

4395 *RASIN'S ARUNDEL COMPLETE*. B. T. Stone, Tunnelton. *Guarantee*—Phosphoric acid, soluble, 7; reverted,

1; insoluble, 1.50; total, 9.50; available, 8; nitrogen, 1.64; potash, 2; phosphoric acid from Charleston, Florida and Tennessee rock, bone tankage, and fish; nitrogen from bone tankage and fish; potash from muriate and manure salts. *Found*: Phosphoric acid, soluble, 6.13; reverted, 3.58; insoluble, 1.09; total, 10.80; available, 11.71; nitrogen, 1.68; potash, 2.12; chlorine, 2.1; availability of nitrogen, 81.

4441 *SEAWALL SPECIAL*. George T. Carskardon, Keyser. *Guarantee*—Phosphoric acid, soluble, 9; reverted, 1; insoluble, 1.50; total, 11.50; available, 10; phosphoric acid from Charleston, Florida and Tennessee rock. *Found*: Phosphoric acid, soluble, 4.81; reverted, 9.74; insoluble, 1.25; total, 15.80; available, 14.55.

4406 *RASIN'S DISSOLVED BONE*. C. W. Mayer, Son & Company, Terra Alta. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 2; insoluble, 1.50; total, 11.50; available, 10; nitrogen, 1.64; phosphoric acid from bone and bone tankage; nitrogen from bone. *Found*: Phosphoric acid, 6.08; reverted, 5.69; insoluble, 3.42; total, 15.19; available, 11.77; nitrogen, 1.64; availability of nitrogen, 82.

4404 *RASIN'S BONE AND POTASH FERTILIZER*. C. W. Mayer, Sons' & Company, Terra Alta. *Guarantee*—Phosphoric acid, soluble, 9; reverted, 1; insoluble, 1.50; total, 11.50; available, 10; potash, 2; phosphoric acid from Charleston, Florida and Tennessee rock; potash from muriate and manure salts. *Found*: Phosphoric acid, soluble, 7.66; reverted, 3.37; insoluble, 1.39; total, 12.42; available, 11.03; potash, 2.17; chlorine, 2.2.

4442 *RASIN'S BONE AND POTASH FERTILIZER*. George T. Carskardon, Keyser. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.93; reverted, 4.30; insoluble, 1.32; total, 12.55; available, 11.23; potash, 2.98; chlorine, 1.3.

4545 *RASIN'S BONE AND POTASH FERTILIZER*.



C. W. Mayer, Son & Co., Terra Alta. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.44; reverted, 6.77; insoluble, 2.51; total, 12.72; available, 10.21; potash, 1.81; chlorine, 2.3.

4563 *RASIN'S ACID PHOSPHATE*. G. T. Hodges, Shepherdstown. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from Charleston, Florida and Tennessee rock. *Found*: Phosphoric acid, soluble, 11.99; reverted, 4.38; insoluble, 0.49; total, 16.86; available, 16.37.

4569 *RASIN'S ACID PHOSPHATE*. P. W. Atkinson, Berkeley Springs. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 12.46; reverted, 4.83; insoluble, 2.62; total, 19.91; available, 17.29.

4394 *RASIN'S ACID PHOSPHATE*. B. T. Stone, Tunnelton. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 10.84; reverted, 4.03; insoluble, 2.46; total, 17.33; available, 14.87.

4405 *RASIN'S ACID PHOSPHATE*. C. W. Mayer, Son & Company, Terra Alta. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.95; reverted, 9.18; insoluble, 1.69; total, 16.82; available, 15.13.

4440 *RASIN'S ACID PHOSPHATE*. George T. Carskadon, Keyser. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 13.55; reverted, 2.60; insoluble, 1.09; total, 17.24; available, 16.15.

4546 *RASIN'S ACID PHOSPHATE*. C. W. Mayer, Son & Company, Terra Alta. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 11.05; reverted, 4.61; insoluble, 3.93; total, 19.59; available, 15.66.

4396 *WILLIAM PENN CROP GROWER*. B. T. Stone, Kingwood. *Guarantee*—Phosphoric acid, soluble, 7; reverted, 1; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 1;

phosphoric acid from Charleston, Florida and Tennessee rock and bone tankage; nitrogen from tankage and bone; potash from muriate and manure salts. *Found:* Phosphoric acid, soluble, 5.65; reverted, 3.57; insoluble, 0.68; total, 9.80; available, 9.12; nitrogen, 1.07; potash, 1.28; chlorine, 1.9; availability of nitrogen, 73.

4506 *WILLIAM PENN CROP GROWER.* J. M. Miller and Brother, Ronceverte. *Guarantee*—(As above). *Found:* Phosphoric acid, soluble, 3.97; reverted, 5.14; insoluble, 1.27; total, 10.38; available, 9.11; nitrogen, 1.01; potash, 1.20; chlorine, 1.8; availability of nitrogen, 87.

#### RICHMOND GUANO COMPANY.

RICHMOND, VIRGINIA.

4507 *HIGH GRADE ACID PHOSPHATE.* J. M. Miller and Brother, Ronceverte. *Guarantee*—Phosphoric acid, soluble, 8; reverted, 6; insoluble, 1; total, 15; available, 14; phosphoric acid from mineral phosphate. *Found:* Phosphoric acid, soluble, 6.82; reverted, 8.97; insoluble, 0.75; total, 16.54; available, 15.79.

#### SCIENTIFIC FERTILIZER COMPANY.

PITTSBURG, PENNSYLVANIA.

4636 *SCIENTIFIC CORN AND GRAIN.* Walter Marshall, Wheeling. *Guarantee*—Phosphoric acid, soluble, 4; reverted, 4; insoluble, 1; total, 9; available, 8; nitrogen, 1.50; potash, 2; phosphoric acid, one-third from tankage, two-thirds from mineral phosphate; nitrogen from tankage and blood; potash from sulphate of potash. *Found:* Phosphoric acid, soluble, 3.53; reverted, 3.14; insoluble, 1.75; total, 8.42; available, 6.67; nitrogen, 1.03; potash, 2.39; chlorine, 2.3; availability of nitrogen, 83. *Remark*—*Source of potash not as guaranteed; is equivalent to kainit.*

4635 *SCIENTIFIC GRAIN GROWER*. Walter Marshall, Wheeling. *Guarantee*—Phosphoric acid, soluble, 4; reverted, 4; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 1; phosphoric acid, one-fifth from tankage, four-fifths from mineral phosphates; nitrogen from tankage and blood; potash from sulphate of potash. *Found*: Phosphoric acid, soluble, 3.71; reverted, 2.63; insoluble, 1.09; total, 7.43; available, 6.34; nitrogen, 1.09; potash, 1.06; chlorine, 3.1; availability of nitrogen, 67. *Remark*—*Source of potash not as guaranteed; is equivalent to kainit; availability of nitrogen low.*

4638 *PURE RAW BONE MEAL*. Walter Marshall, Wheeling. *Guarantee*—Phosphoric acid, total, 22; nitrogen, 3.25; phosphoric acid from bone; nitrogen from bone. *Found*: Phosphoric acid, total, 24.84; nitrogen, 2.39; availability of nitrogen, 88.

### SWIFT & COMPANY.

CHICAGO, ILL.

4456 *SWIFT'S SUPER-PHOSPHATE*. Sencindiver & Stewart, Martinsburg. *Guarantee*—Phosphoric acid, insoluble, 4; total, 12; available, 8; nitrogen, 1.64; potash, 2; phosphoric acid from bone and phosphate rock; nitrogen from blood and tankage; potash from muriate. *Found*: Phosphoric acid, soluble, 6.29; reverted, 6.76; insoluble, 2.02; total, 15.07; available, 13.05; nitrogen, 1.93; potash, 2.20; chlorine, 0.9; availability of nitrogen, 84.

4466 *SWIFT'S SUPER-PHOSPHATE*. A. M. Carson Store Company, Ripley. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.07; reverted, 3.32; insoluble, 2.17; total, 12.56; available, 10.39; nitrogen, 1.54; potash, 2.26; chlorine, 1.0; availability of nitrogen, 81.

4540 *SWIFT'S SUPER-PHOSPHATE*, Washington & Alexander, Charles Town. *Guarantee*—(As above). *Found*:

Phosphoric acid, soluble, 2.65; reverted, 5.94; insoluble, 2.48; total, 11.07; available, 8.59; nitrogen, 1.65; potash, 2.04; chlorine, 1.0; availability of nitrogen, 92.

4457 *SWIFT'S COMPLETE FERTILIZER*. Sencindiver & Stewart, Martinsburg. *Guarantee*—Phosphoric acid, insoluble, 3; total, 11; available, 8; nitrogen, 1; potash, 1; phosphoric acid from bone and phosphate rock; nitrogen from blood and tankage; potash from muriate. *Found*: Phosphoric acid, soluble, 6.37; reverted, 4.80; insoluble, 2.01; total, 13.18; available, 11.17; nitrogen, 1.33; potash, 1.15; chlorine, 1.0; availability of nitrogen, 86.

4467 *SWIFT'S COMPLETE FERTILIZER*. A. M. Carson Store Company, Ripley. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.42; reverted, 4.56; insoluble, 2.35; total, 12.33; available, 9.98; nitrogen, 1.00; potash, 1.68; chlorine, 1.2; availability of nitrogen, 85.

4538 *SWIFT'S COMPLETE FERTILIZER*. Washington & Alexander, Charles Town. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.56; reverted, 3.87; insoluble, 1.33; total, 8.76; available, 7.43; nitrogen, 1.01; potash, 1.01; chlorine, 1.4; availability of nitrogen, 86.

4443 *SWIFT'S BONE MEAL*. George T. Carskadon, Keyser. *Guarantee*—Phosphoric acid, total, 25; nitrogen, 2.50; phosphoric acid from bone; nitrogen from bone. *Found*: Phosphoric acid, total, 25.92; nitrogen, 2.50; availability of nitrogen, 87.

4455 *SWIFT'S BONE MEAL*. Sencindiver & Stewart, Martinsburg. *Guarantee*—(As above). *Found*: Phosphoric acid, total, 26.19; nitrogen, 2.42; availability of nitrogen, 94.

4468 *SWIFT'S BONE MEAL*. A. M. Carson Store Company, Ripley. *Guarantee*—(As above). *Found*: Phosphoric acid, total, 26.07; nitrogen, 2.48; availability of nitrogen, 89.

4539 *SWIFT'S BONE MEAL*. Washington & Alexander, Charles Town. *Guarantee*—(As above). *Found*: Phosphoric acid, total, 26.23; nitrogen, 2.56; availability of nitrogen, 90.

VIRGINIA-CAROLINA CHEMICAL COMPANY.

RICHMOND VIRGINIA.

4511 *ALLISON & ADDISON STAR BRAND GUANO*. J. M. Miller and Brother, Ronceverte. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 1.65; potash, 1; phosphoric acid from phosphate rock and animal bone; nitrogen from fish tankage, blood, nitrate of soda, sulphate of ammonia and cotton seed meal; potash from muriate and sulphate. *Found*: Phosphoric acid, soluble, 4.71; reverted, 3.80; insoluble, 1.55; total, 10.06; available, 8.51; nitrogen, 1.92; potash, 1.26; chlorine, 1.6; availability of nitrogen, 93. *Remark*—Source of potash equivalent to muriate.

4601 *ALLISON & ADDISON STAR BRAND GUANO*. E. W. McNeer, Lowell. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.95; reverted, 3.73; insoluble, 1.73; total, 11.41; available, 9.68; nitrogen, 1.65; potash, 1.30; chlorine, 1.9; availability of nitrogen, 88. *Remark*—Source of potash equivalent to muriate.

4509 *ALLISON & ADDISON LITTLE GIANT GRAIN AND GRASS GROWER*. J. M. Miller & Brother, Ronceverte. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 1; total, 9; available, 8; nitrogen, 0.82; potash, 2; phosphoric acid from phosphate rock and animal bone; nitrogen from fish tankage and cotton seed meal; potash from muriate and sulphate of potash. *Found*: Phosphoric acid, soluble, 4.89; reverted, 3.72; insoluble, 1.04; total, 9.65; available, 8.61; nitrogen, 0.84; potash, 1.90; chlorine, 2.4; availability of nitrogen, 89. *Remark*—Source of potash equivalent to kainit.

4603 *ALLISON & ADDISON LITTLE GIANT GRAIN AND GRASS GROWER*. E. W. McNeer, Lowell. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.63; reverted, 2.96; insoluble, 1.73; total, 11.32; available, 9.59; nitrogen, 0.82; potash, 1.84; chlorine, 2.00; availability of nitrogen, 82. *Remark*—Source of potash equivalent to low grade muriate.

4510 *ALLISON & ADDISON STANDARD ACID PHOSPHATE*. J. M. Miller & Brother, Ronceverte. *Guarantee*—Phosphoric acid, soluble, 9; reverted, 3; insoluble, 1.50; total, 13.50; available, 12; phosphoric acid from phosphate rock. *Found*: Phosphoric acid, soluble, 5.63; reverted, 7.26; insoluble, 2.00; total, 14.89; available, 12.89.

4602 *ALLISON & ADDISON STANDARD ACID PHOSPHATE*. E. W. McNeer, Lowell. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.84; reverted, 7.02; insoluble, 1.52; total, 15.38; available, 13.86.

4600 *J. C. TINSLEY & COMPANY'S "STONE WALL" BRAND ACID PHOSPHATE*. E. W. McNeer, Lowell. *Guarantee*—Phosphoric acid, soluble, 7; reverted, 3; insoluble, 1; total, 11; available, 10; phosphoric acid from phosphate rock. *Found*: Phosphoric acid, soluble, 7.79; reverted, 4.83; insoluble, 1.34; total, 13.96; available, 12.62.

4533 *VIRGINIA-CAROLINA CHEMICAL COMPANY'S GUARANTEED 14 PER CENT ACID PHOSPHATE*. Washington & Alexander, Charles Town. *Guarantee*—Phosphoric acid, soluble, 12; reverted, 2; insoluble, 1; total, 15; available, 14; phosphoric acid from Tennessee, Florida and Charleston rocks. *Found*: Phosphoric acid, soluble, 7.84; reverted, 10.65; insoluble, 0.55; total, 19.04; available, 18.49.

4564 *VIRGINIA-CAROLINA CHEMICAL COMPANY'S GUARANTEED 14 PER CENT ACID PHOSPHATE*. G. T. Hodges, Shepherdstown. *Guarantee*—(As above). *Found*:

Phosphoric acid, soluble, 13.38; reverted, 3.22; insoluble, 1.55; total, 18.15; available, 16.60.

4534 VIRGINIA-CAROLINA CHEMICAL COMPANY'S STANDARD BONE AND POTASH. Washington & Alexander, Charles Town. *Guarantee*—Phosphoric acid, soluble, 9; reverted, 1; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from Tennessee, Florida and Charleston rock; potash from muriate and manure salts. *Found*: Phosphoric acid, soluble, 4.08; reverted, 6.45; insoluble, 2.48; total, 13.01; available, 10.53; potash, 1.13; chlorine, 3.4. *Remark*—Source of potash equivalent to kainit.

4486 TRAVERS WHEAT AND GRASS FERTILIZER. L. P. Wills, Ansted. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 2; total, 10; available, 8; nitrogen, 0.82; potash, 1; phosphoric acid from phosphate rock and animal bone; nitrogen from fish, animal tankage and cotton seed meal; potash from muriate, sulphate and double manure salt. *Found*: Phosphoric acid, soluble, 4.59; reverted, 4.05; insoluble, 1.12; total, 9.76; available, 8.64; nitrogen, 1.03; potash, 1.04; chlorine, 1.6; availability of nitrogen, 80. *Remark*—Source of potash equivalent to muriate.

4489 TRAVERS BEEF, BLOOD AND BONE FERTILIZER. L. P. Wills, Ansted. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 2; total, 10; available, 8; nitrogen, 1.65; potash, 1; phosphoric acid from phosphate rock and animal bone; nitrogen from fish, animal tankage and cotton seed meal; potash from muriate, sulphate, double manure salt. *Found*: Phosphoric acid, soluble, 4.99; reverted, 3.79; insoluble, 1.07; total, 9.85; available, 8.78; nitrogen, 1.30; potash, 1.02; chlorine, 2.5; availability of nitrogen, 80. *Remark*—Source of potash equivalent to kainit.

4604 TRAVER'S BEEF, BLOOD AND BONE FERTIL-

*IZER.* E. W. McNeer, Lowell. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 6.52; reverted, 2.88; insoluble, 1.19; total, 10.59; available, 9.40; nitrogen, 1.86; potash, 2.07; chlorine, 2.3; availability of nitrogen, 85. *Remark*—*Source of potash equivalent to low grade muriate.*

4508 *TRAVER'S CHAMPION CORN GROWER FERTILIZER.* J. M. Miller & Bro., Ronceverte. *Guarantee*—Phosphoric acid, soluble, 6; reverted, 2; insoluble, 2; total, 10; available, 8; nitrogen, 0.82; potash, 1; phosphoric acid from phosphate rock and animal bone; nitrogen from fish, animal tankage, and cotton seed meal; potash from muriate, sulphate and double manure salt. *Found*: Phosphoric acid, soluble, 5.41; reverted, 5.37; insoluble, 0.95; total, 11.73; available, 10.78; nitrogen, 1.00; potash, 1.22; chlorine, 0.9; availability of nitrogen, 88. *Remark*—*Source of potash equivalent to high grade muriate.*

4488 *TRAVER'S CAPITOL BONE AND POTASH COMPOUND.* L. P. Wills, Ansted. *Guarantee*—Phosphoric acid, soluble, 7; reverted 3; insoluble, 1; total, 11; available, 10; potash, 2; phosphoric acid from phosphate rock; potash from muriate, sulphate and double manure salt. *Found*: Phosphoric acid, soluble, 3.72; reverted, 6.40; insoluble, 1.52; total, 11.64; available, 10.12; potash, 1.60; chlorine, 2.4. *Remark*—*Source of potash equivalent to kainit.*  
*ate.*

4487 *TRAVER'S CAPITOL DISSOLVED S. C. BONE.* L. P. Wills, Ansted. *Guarantee*—Phosphoric acid, soluble, 9; reverted, 3; insoluble, 1; total, 13; available, 12; phosphoric acid from phosphate rock. *Found*: Phosphoric acid, soluble, 6.04; reverted, 4.44; insoluble, 1.84; total, 12.32; available, 10.48.

4621 *TRAVER'S CAPITOL DISSOLVED S. C. BONE.* E. W. McNeer, Lowell. *Guaranteed*—(As above). *Found*: Phosphoric acid, soluble, 6.86; reverted, 5.93; insoluble, 1.37; total, 14.16; available, 12.79.



## VIRGINIA STATE FERTILIZER COMPANY.

## LYNCHBURG, VIRGINIA.

## 4522 VIRGINIA STATE HIGH GRADE GUANO.

Payne Brothers, Seebert. *Guarantee*—Phosphoric acid, insoluble, 1; total, 9; available, 8; nitrogen, 2; potash, 2; phosphoric acid from Tennessee phosphate rock; nitrogen from tankage; potash from sylvinite. *Found*: Phosphoric acid, soluble, 6.37; reverted, 4.41; insoluble, 0.68; total, 11.46; available, 10.78; nitrogen, 1.43; potash, 1.74; chlorine, 2.7; availability of nitrogen, 92.

4523 MOUNTAIN TOP BONE AND POTASH MIXTURE. Payne Brothers, Seebert. *Guarantee*—Phosphoric acid, insoluble, 1; total, 11; available, 10; potash, 5; phosphoric acid from Tennessee phosphate rock; potash from sylvinite. *Found*: Soluble phosphoric acid, 7.74; reverted, 4.70; insoluble, 0.51; total, 12.95; available, 12.44; potash, 5.27; chlorine, 1.5. *Remark*—Source of potash equivalent to muriate.

4524 BLOOD AND BONE PHOSPHATE. Payne Brothers, Seebert. *Guarantee*—Phosphoric acid, insoluble 1; total, 19; available, 9; nitrogen, 1; potash, 1; phosphoric acid from Tennessee phosphate rock; nitrogen from tankage; potash from sylvinite. *Found*: Phosphoric acid, soluble, 5.82; reverted, 4.84; insoluble, 1.10; total, 11.76; available, 10.66; nitrogen, 0.86; potash, 1.21; chlorine, 2.8; availability of nitrogen, 90.

4525 "GILT EDGE" BRAND ACID PHOSPHATE. Payne Brothers, Seebert. *Guarantee*—Phosphoric acid, insoluble, 1; total, 15; available, 14; phosphoric acid from Tennessee phosphate rock. *Found*: Phosphoric acid, soluble, 9.20; reverted, 5.72; insoluble, 1.15; total, 16.07; available, 14.92.

## WALKER STRATMAN &amp; COMPANY.

PITTSBURG, PENNSYLVANIA.

4626 *HELP MATE*. Cox Brothers, West Union. *Guarantee*—Phosphoric acid, soluble, 7; reverted, 5; insoluble, 1; total, 13; available, 12; phosphoric acid from mineral phosphate. *Found*: Phosphoric acid, soluble, 4.68; reverted, 5.79; insoluble, 2.48; total, 12.95; available, 10.47.

4637 *HELP MATE*. Pullman Hardware Company, Pullman. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 4.22; reverted, 6.72; insoluble, 2.15; total, 13.09; available, 10.94.

4627 *BONE AND MEAT*. Cox Brothers, West Union. *Guarantee*—Phosphoric acid, total, 16; nitrogen, 3.25; phosphoric acid from bone and tankage; nitrogen from bone and tankage. *Found*: Phosphoric acid, total, 16.14; nitrogen, 3.51; availability of nitrogen, 93.

4644 *BONE AND MEAT*. Lazear Brothers, Sistersville. *Guarantee*—(As above). *Found*: Phosphoric acid, total, 18.54; nitrogen, 3.01; availability of nitrogen, 93.

4625 *FOUR FOLD*. Cox Brothers, West Union. *Guarantee*—Phosphoric acid, soluble, 4; reverted, 4; insoluble, 1; total, 9; available, 8; nitrogen, 1.50; potash, 2; phosphoric acid, one-third from tankage, two-thirds from mineral phosphate; nitrogen from blood and tankage; potash from sulphate of potash. *Found*: Phosphoric acid, soluble, 4.08; reverted, 3.70; insoluble, 0.64; total, 8.42; available, 7.78; nitrogen, 0.97; potash, 2.20; chlorine, 2.4; availability of nitrogen, 79. *Remark*—*Source of potash equivalent to kainit; sulphate was guaranteed.*

4639 *FOUR FOLD*. Lazear Brothers, Sistersville. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.65; reverted, 3.41; insoluble, 2.02; total, 9.08; available, 7.06; nitrogen,

0.97; potash, 2.28; chlorine, 2.5; availability of nitrogen, 87. *Remark*—*Source of potash equivalent to kainit.*

4639 *FOUR FOLD*. Lazear Brothers, Sistersville. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 3.65; reverted, 3.41; insoluble, 2.02; total, 9.08; available, 7.06; nitrogen, 0.97; potash, 2.28; chlorine, 2.5; availability of nitrogen, 87. *Remark*—*Source of potash equivalent to kainit.*

ROBERT A. WOOLDRIDGE COMPANY.

BALTIMORE, MD.

4609 *FLORIDA ACID PHOSPHATE*. J. H. Philipps, Berkeley Springs. *Guarantee*—Available phosphoric acid, 14, from dissolved phosphate rock. *Found*: Phosphoric acid, soluble, 11.58; reverted, 4.55; insoluble, 1.27; total, 17.40; available, 16.13.

4449 *GERMAN POTASH MIXTURE*. J. W. Loughery, Rowlesburg. *Guarantee*—Available phosphoric acid, 10, from dissolved phosphate rock; potash, 2, from German kainit. *Found*: Phosphoric acid, soluble, 1.29; reverted, 8.31; insoluble, 1.85; total, 11.45; available, 9.60; potash, 2.02; chlorine, 3.4.

4370 *LIBERTY BELL POTASH MIXTURE*. E. F. Wadsworth, Ashley. *Guarantee*—Available phosphoric acid, 12, from dissolved phosphate rock; potash, 3, from kainit and manure salts. *Found*: Phosphoric acid, soluble, 10.06; reverted, 2.39; insoluble, 0.26; total, 12.61; available, 12.35; potash, 3.01; chlorine, 1.5.

4463 *LIBERTY BELL POTASH MIXTURE*. J. W. Loughery, Rowlesburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 10.09; reverted, 2.78; insoluble, 0.13; total, 13.00; available, 12.87; potash, 3.15; chlorine, 2.3.

4589 *LIBERTY BELL POTASH MIXTURE*. F. J. Fesler, Philippi. *Guarantee*—(As above). *Found*: Phosphoric

acid, soluble, 8.06; reverted, 3.59; insoluble, 0.49; total, 12.14; available, 11.65; potash, 2.58; chlorine, 2.7. *Remark*—*Source of potash equivalent to kainit.*

4416 *CHAMPION GIANT PHOSPHATE*. C. B. Borgman, Howsville. *Guarantee*—Phosphoric acid, available, 9; from dissolved phosphate rock and dissolved animal bone; nitrogen, 1; from high grade tankage and fish; potash, 2; from manure salts and kainit. *Found*: Phosphoric acid, soluble, 6.83; reverted, 4.57; insoluble, 0.73; total, 12.13; available, 11.40; nitrogen, 1.07; potash, 2.36; chlorine, 4.1; availability of nitrogen, 79. *Remark*—*Source of potash equivalent to kainit.*

4458 *CHAMPION GIANT PHOSPHATE*. J. W. Loughery, Rowlesburg. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 7.10; reverted, 1.96; insoluble, 0.50; total, 9.56; available, 9.06; nitrogen, 1.09; potash, 2.59; chlorine, 4.00; availability of nitrogen, 74. *Remark*—*Source of potash equivalent to kainit.*

4616 *CHAMPION GIANT PHOSPHATE*. J. H. Philipps and Sons, Berkeley Springs. *Guarantee*—(As above). *Found*: Phosphoric acid, soluble, 5.19; reverted, 5.89; insoluble, 1.25; total, 12.33; available, 11.08; nitrogen, 1.01; potash, 2.07; chlorine, 3.8; availability of nitrogen, 63. *Remark*—*Source of potash equivalent to kainit; availability of nitrogen low.*

4588 *CHIEFTAIN BONE AND STOCK PHOSPHATE*. F. J. Fesler, Philippi. *Guarantee*—Phosphoric acid, available, 8, from dissolved phosphate rock and dissolved animal bone; nitrogen, 2; from high grade tankage, blood and fish; potash, 2, from manure salts and kainit. *Found*: Phosphoric acid, soluble, 4.31; reverted, 4.21; insoluble, 1.41; total, 9.93; available, 8.52; nitrogen, 2.18; potash, 2.13; chlorine, 3.3; availability of nitrogen, 87. *Remark*—*Source of potash equivalent to kainit.*

4371 *TRIUMPH BONE STOCK PHOSPHATE*. E. F. Wadsworth, Ashley. *Guarantee*—Phosphoric acid, available, 8, from dissolved phosphate rock and dissolved animal bone; nitrogen, 1.50, from high grade tankage, blood and fish; potash, 4, from manure salts and muriate. *Found*: Phosphoric acid, soluble, 6.90; reverted, 2.05; insoluble, 0.79; total, 9.74; available, 8.95; nitrogen, 1.30; potash, 3.94; chlorine, 2.3; availability of nitrogen, 83. *Remark*—*Source of potash equivalent to low grade muriate.*

4451 *DOUBLE QUICK BONE PHOSPHATE*. J. W. Loughery, Rowlesburg. *Guarantee*—Phosphoric acid, available, 9, from dissolved phosphate rock and dissolved animal bone; nitrogen, 2.75, from high grade tankage, blood and sulphate of ammonia; potash, 3, from high grade muriate and manure salts. *Found*: Phosphoric acid, soluble, 6.32; reverted, 2.36; insoluble, 0.95; total, 9.71; available, 8.76; nitrogen, 2.46; potash, 3.15; chlorine, 2.5; availability of nitrogen, 88. *Remark*—*Source of potash not as guaranteed; is equivalent to kainit.*

4372 *SPECIAL POTATO FERTILIZER*. E. F. Wadsworth, Ashley. *Guarantee*—Phosphoric acid, available, 9, from dissolved phosphate rock and dissolved animal bone; nitrogen, 2, from tankage, blood and fish; potash, 5, from high grade muriate and manure salt. *Found*: Phosphoric acid, soluble, 8.57; reverted, 1.17; insoluble, 0.84; total, 10.58; available, 9.74; nitrogen, 1.87; potash, 5.91; chlorine, 1.8; availability of nitrogen, 90.

## Registered Brands.

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The following is a list of the brands which have been registered, as required by law, for the year ending December 31, 1902:

### AMERICAN AGRICULTURAL CHEMICAL DEPARTMENT

#### BALTIMORE SALES DEPARTMENT.

Grain and Grass Grower.  
Super-phosphate.  
Gem Alkaline Bone.  
Regular Corn Fertilizer.  
Dissolved Animal Bone.  
Bone Meal.  
Fine Ground Bone.  
Pure Ground Bone.  
W. & A. Special Fall Mixture.  
Kainit.  
Langdon Mixture.  
Bradley's Dissolved Bone with Potash.  
Bradley's Bean and Potato Potash.  
Bradley's Niagara Phosphate.  
Bradley's Alkaline Bone.  
Canton Chemical Eagle Phosphate.  
Canton Chemical Potato Manure.  
Canton Chemical Resurgam Guano.  
Canton Chemical Game Guano.  
Canton Chemical C. C. C. Special Compound.

- Canton Chemical Special Wheat, Corn and Grass Fertilizer.  
Canton Chemical "Harrow" Brand Crop Grower.  
Canton Chemical Soluble Bone and Potash.  
Canton Chemical Dissolved S. C. Bone.  
Canton Chemical Soluble Alkaline Bone.  
Canton Chemical Patrons Bone Mixture.  
Cleveland Dryer Forest City Buckeye.  
Cleveland Dryer Phospho Bone.  
Cleveland Dryer Horse Head Phosphate.  
Cleveland Dryer Horse Head Phosphate with Potash.  
Cleveland Dryer XXX Phosphate.  
Detrick Quick Step Bone Phosphate for Potatoes and Tobacco.  
Detrick Soluble Bone Phosphate and Potash.  
Detrick Kangaroo Komplete Kompond.  
Detrick Dissolved S. C. Bone.  
Detrick Standard Potash Fertilizer.  
Detrick Corn and Oats Fertilizer.  
Detrick Imperial Compound.  
Detrick Paragon Ammoniated Dissolved Bone Phosphate and Potash.  
Great Eastern Unammoniated Wheat Special.  
Great Eastern Corn Fertilizer.  
Great Eastern Vegetable, Vine and Tobacco.  
Great Eastern English Wheat Grower.  
Great Eastern Soluble Bone and Potash.  
Great Eastern Dissolved Bone.  
Lazaretto Bone Compound.  
Lazaretto Special Potato Fertilizer.  
Lazaretto Ammoniated Bone Phosphate.  
Lazaretto Excelsior A. A. A.  
Lazaretto Ammoniated Bone Phosphate.  
Lazaretto Dissolved Bone Phosphate and Potash.  
Lazaretto High Grade Dissolved Bone and Potash.  
Maryland Ammoniated Bone.

Maryland O. K. Ammoniated Fertilizer.  
Maryland Tornado Fertilizer.  
Maryland Bone Super-phosphate.  
Maryland Dissolved S. C. Bone.  
Pacific Nobsque Guano.  
Pacific A. No. 1 Phosphate.  
Pacific Potato Phosphate.  
Pacific Dissolved Bone and Potash.  
Pacific Dissolved Bone and Phosphate.  
Reese's Half and Half.  
Reese's Elm Phosphate.  
Reese's High Grade Potash Mixture.  
Susquehannah Alkaline Bone Phosphate.  
Susquehannah Potato Phosphate.  
Susquehannah XXV Phosphate.  
Susquehannah Superior Rock Phosphate.  
Tygert Allen Star Dissolved S. C. Rock.  
Tygert Allen Corn and Oats Phosphate.  
Williams & Clark's Royal Bone Phosphate.  
Williams & Clark's Prolific Crop Producer.  
Williams & Clark's Good Grower Potato Phosphate.  
Williams & Clark's Dissolved Bone and Potash.  
Williams & Clark's Acorn Acid Phosphate.  
Zell's Special Compound for Potatoes and Vegetables.  
Zell's Ammoniated Bone Super-phosphate.  
Zell's Economizer Phosphate.  
Zell's Little Giant.  
Zell's Electric Phosphate.  
Zell's Dissolved Bone Phosphate.  
Zell's Dissolved S. C. Phosphate.

THE ABBOTT & MARTIN RENDERING COMPANY.

COLUMBUS, OHIO.

Ideal Grain Grower.



ARMOUR FERTILIZER WORKS.

BALTIMORE, MARYLAND.

Star Phosphate.  
 Phosphate and Potash No. 1.  
 Ammoniated Bone with Potash.  
 High Grade Potash.  
 Grain Grower.  
 Wheat, Corn and Oats Special.  
 Cereal Phosphate.  
 Bone Meal.

THE BALTIMORE PULVERIZING COMPANY.

BALTIMORE, MARYLAND.

Special Fall Mixture.

BAUGH & SONS COMPANY.

BALTIMORE, MARYLAND.

Baugh's Corn Fertilizer.  
 Baugh's Potato Fertilizer.  
 Baugh's Fish Mixture.  
 Baugh's Special Potato Manure.  
 Baugh's Raw Bone Super-phosphate.  
 Baugh's Peninsula Grain Producer.  
 Baugh's Export Bone with Potash.  
 Baugh's Warranted Pure Bone Meal.  
 Baugh's Dissolved Animal Bones.  
 Baugh's Double Eagle Phosphate.  
 Baugh's General Crop Grower.  
 Baugh's Animal Bone and Potash Compound.  
 Baugh's Wheat Fertilizer.  
 Baugh's High Grade Acid Phosphate or Dissolved S. C.  
 Rock.  
 Baugh's Soluble Alkaline Super-phosphate.

Baugh's Excelsior Super-phosphate.  
Baugh's Ammoniated Soluble Alkaline.

BOWKER FERTILIZER COMPANY.

BOSTON, MASS.

Bowker's Harvest Bone.  
Bowker's Dissolved Bone.  
Bowker's Dissolved Bone with Potash.  
Bowker's Soluble Bone.  
Bowker's Bone Meal.

CHICAGO FERTILIZER COMPANY.

CHICAGO, ILL.

Bone, Blood and Potash.  
Wheat and Corn Special.

CINCINNATI PHOSPHATE COMPANY.

CINCINNATI, OHIO.

Capitol Wheat Grower.  
Capitol Grain and Grass Grower.  
Capitol Dissolved Bone and Potash.  
Capitol Super-phosphate.  
Capitol Ground Bone.  
Capitol Tobacco Food.

L. FRANK & SONS.

ZANESVILLE, OHIO.

Enterprise.  
Electric.  
Antitrust.

S. M. HESS & BROTHER.

PHILADELPHIA, PA.

Wheat and Grass Manure.

Soluble Bone and Potash.  
 Soluble Bone.  
 Emperor Phosphate.  
 Keystone Bone Phosphate.

JARECHI CHEMICAL COMPANY.

SANDUSKY, OHIO.

No. 1 Fish Guano.  
 C. O. D. Phosphate.  
 Ground Bone.  
 Dissolved Bone with Potash.  
 Fish and Potash, Potato and Tobacco Food.  
 St. Bernard Phosphate.  
 Phosphate and Potash.

LAZARETTO GUANO WORKS.

BALTIMORE, MARYLAND.

Ruth's Dissolved Bone Phosphate.  
 Reliable.  
 Brodbeck's Alkaline Phosphate.  
 Nitrate of Soda.

MARIETTA BONE AND PHOSPHATE COMPANY.

MARIETTA, OHIO.

"Horse" Brand Pure Raw Bone.  
 "Horse" Brand Potato and Truck Special.  
 "Horse" Brand Corn, Oats and Wheat Grower.  
 "Horse" Brand Acid Phosphate.

NORTHWESTERN FERTILIZER COMPANY.

CHICAGO, ILL.

"Horse Shoe" Brand Garden City Super-phosphate.

## G. OBER &amp; SONS' COMPANY.

BALTIMORE, MARYLAND.

Ober's Dissolved Animal Bone.  
Ober's Farmers Standard Ammoniated Phosphate.  
Ober's Farmers Mixture.  
Ober's Independent Ammoniated Super-phosphate.  
Ober's Dissolved Bone Phosphate.  
Ober's Dissolved Bone Phosphate and Potash.  
Ober's High Grade Acid Phosphate.  
Ober's Pure Raw Bone Meal.  
Ober's Pure Bone Meal.  
Ober's Special Mixture for Wheat.  
Ober's S. & S. Special Wheat Compound.  
Ober's Shenandoah Bone Phosphate.

## OHIO FARMERS' FERTILIZER COMPANY.

COLUMBUS, OHIO.

Raw Bone Meal.  
Corn, Oats and Wheat Fish Guano.  
General Crop Fish Guano.  
Wheat Maker and Seeding Down.  
Pota and Tobacco Special.  
Acid Phosphate.  
Superior Phosphate.  
Soluble Bone and Potash.

## PIEDMONT MT. AIRY GUANO COMPANY.

BALTIMORE, MARYLAND.

Piedmont Pure Raw Bone Mixture.  
Piedmont Royal Ammoniated Bone and Potash.  
Piedmont Dissolved Bone Phosphate, Potash Goods.  
Piedmont High Grade S. C. Bone.  
Piedmont Potato Producer.  
Piedmont Farmer's High Grade Bone and Potash.

Piedmont "Plow" Brand.  
 Piedmont Special Potash Mixture.  
 Piedmont Soluble Bone and Potaosh.  
 Piedmont Harvest Queen.  
 Piedmont Farmers Favorite.  
 Levering's Excelsior.

R. H. POLLOCK.

BALTIMORE, MD.

Pollock's Dissolved S. C. Bone.  
 Pollock's Victor Bone Phosphate.  
 Pollock's Special Wheat Grower.  
 Pollock's Ammoniated Bone Phosphate.

W. S. POWELL & COMPANY.

BALTIMORE, MD.

Powell's Dissolved S. C. Bone.  
 Powell's Bone and Potash.  
 Powell's Red Tag Fertilizer.

POWHATAN CHEMICAL COMPANY.

RICHMOND, VA.

Magic Wheat Grower.  
 Magic Special Fertilizer.  
 Magic Ammoniated Phosphate.  
 Magic Bone and Potash Mixture.  
 Bone and Potash Mixture.  
 Dissolved S. C. Phosphate.  
 Virginia Dissolved Bone.

RASIN MONUMENTAL COMPANY.

BALTIMORE, MD.

Rasin's XXX Fertilizer.  
 Rasin's IXL Fertilizer.

Rasin's Empire Guano.  
Rasin's Bone and Potash Fertilizer.  
Rasin's Acid Phosphate.  
Rasin's Ammoniated Super-phosphate.  
Rasin's Dissolved Bone.  
William Penn Crop Grower.  
Arundel Complete.  
Special Formula Corn and Buckwheat.  
Seawell Special.  
Monumental Potato Manure.  
Monumental Acid Phosphate.  
S. & S. Special Wheat Compound.

## RICHMOND GUANO COMPANY.

RICHMOND, VA.

"Premium" Brand Fertilizer.  
"Premium" Brand Wheat Grower.  
Bone Mixture.  
Bone and Potash Mixture.  
High Grade Acid Phosphate.

## SCIENTIFIC FERTILIZER COMPANY.

PITTSBURG, PA.

Scientific Phosphate and Potash.  
Scientific Dissolved Bone.  
Scientific Wheat and Clover.  
Scientific Bone, Meat and Potash.  
Scientific Bone and Potash.  
Scientific Economy.  
Scientific Potato.  
Scientific Corn and Grain.  
Scientific Grain Grower.  
Bone and Meat.  
Pure Raw Bone Meal.  
High Grade Acid Phosphate.

SWIFT & COMPANY.

CHICAGO, ILL.

Swift's Super-phosphate.  
 Swift's Complete Fertilizer.  
 Swift's Bone and Potash.  
 Swift's Bone Meal.  
 Swift's Pure Raw Bone Meal.  
 Swift's Champion Wheat Grower.  
 Swift's Ammoniated Bone.  
 Swift's Virginia Tobacco Grower.  
 Swift's Champion Corn Grower.  
 Swift's Ammoniated Bone and Potash.  
 Swift's Vegetable Grower.  
 Swift's Potato and Tobacco Grower.

I. P. THOMAS & COMPANY.

PHILADELPHIA, PA.

S. C. Phosphate.  
 Alkaline Bone.

VIRGINIA-CAROLINA CHEMICAL COMPANY.

RICHMOND, VA.

Allison & Addison Star Brand Guano.  
 Allison & Addison Little Giant Grain and Grass Grower.  
 Allison & Addison Standard Acid Phosphate.  
 Allison & Addison B. P. Potash Mixture.  
 J. G. Tinsley's Stone Wall Guano.  
 J. G. Tinsley's Wheat and Grass Grower.  
 J. G. Tinsley's Powhatan Phosphate.  
 J. G. Tinsley's Stone Wall Acid Phosphate.  
 J. G. Tinsley's Bone and Potash Mixture.  
 S. W. Travers' Wheat and Grass Fertilizer.  
 S. W. Travers' Beef, Blood and Bone Fertilizer.  
 S. W. Travers' Champion Corn Grower Fertilizer.

S. W. Travers' Capitol Bone-Potash Compound.

S. W. Travers' Capitol Dissolved S. C. Bone.

S. W. Travers' Dissolved Bone Phosphate.

Standard Bone and Potash.

*Guaranteed*—14 per cent Acid Phosphate.

## THE VIRGINIA STATE FERTILIZER COMPANY.

LYNCHBURG, VA.

Virginia State High Grade Guano.

Blood and Bone Phosphate.

Mountain Top Bone and Potash Mixture.

"Gilt Edge" Dissolved Bone and Potash.

"Gilt Edge" Acid Phosphate.

Lurich Acid Phosphate.

Bull Run Acid Phosphate.

## WALKER, STRATMAN & COMPANY.

PITTSBURG, PA.

Phosphoric Acid and Potash.

Help Mate.

Pure Raw Bone.

Bone and Meat.

Grain King.

Acid Phosphate.

Meat, Blood and Bone with Potash.

Potash and Bone Phosphate.

Big Bonanza.

Potato Special.

Four Fold.

Grain Manure.

## ROBERT A. WOOLDRIDGE COMPANY.

BALTIMORE, MD.

Florida Acid Phosphate.



German Potash Mixture.

Liberty Bell Potash Mixture.

Old Sledge Phosphate.

Champion Giant Phosphate.

Chieftain Bone Stock Phosphate.

Triumph Bone Stock Phosphate.

Buffalo Bone Stock Phosphate.

Double Quick Bone Stock Phosphate.

Special Potato Fertilizer.

Sweepstakes "Sureshot" Truck Phosphate.

Golden Crown Truck Phosphate.

Pure Raw Bone.

## Unregistered Brands Found on Sale During 1902.

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### BAUGH & SONS' COMPANY.

BALTIMORE, MD.

Baugh's Genuine German Kainit.

### JARECHI CHEMICAL COMPANY.

SANDUSKY, O.

"Square" Brand Phosphate and Potash.

### RAMSBERG FERTILIZER COMPANY.

FREDERICK, MD.

Ramsberg Dissolved Bone Super-phosphate.

Ramsberg Excelsior Plant Food.

### RASIN MONUMENTAL COMPANY.

BALTIMORE, MD.

Rasin's Ground Bone.

### VIRGINIA-CAROLINA CHEMICAL COMPANY.

RICHMOND, VA.

Ground Bone Meal.

Special Compound for Wheat.

## List of Agents Whose Stock Was Sampled During 1902.

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|                                    |                  |
|------------------------------------|------------------|
| Armstrong, Chrislip & Company..... | Buckhannon       |
| Allender Brothers.....             | Toll Gate        |
| P. W. Atkinson.....                | Berkeley Springs |
| C. H. Becker.....                  | Wheeling         |
| Bishop & Barbe.....                | Jane Lew         |
| C. B. Borgman.....                 | Howsville        |
| Bush & Sleeth.....                 | Toll Gate        |
| W. H. Brady.....                   | Berkeley Springs |
| H. C. Bare Hardware Company.....   | Alderson         |
| J. S. Burdette.....                | Alderson         |
| George Brinkman .....              | Grafton          |
| W. H. Bailey & Co.....             | Morgantown       |
| O. R. Carmen.....                  | Wellsburg        |
| W. L. Cole.....                    | Clarksburg       |
| O. P. Cox & Son.....               | Toll Gate        |
| George T. Carskadon.....           | Keyser           |
| A. M. Carson's Store Company.....  | Ripley           |
| Cast & Holden.....                 | Clarksburg       |
| J. J. Chisler.....                 | Fairmont         |
| L. W. Conaway.....                 | Laurel Point     |
| A. G. Chrislip.....                | Philippi         |
| Cox Brothers.....                  | West Union       |
| Drummond & Co.....                 | Buckhannon       |
| Exchange Mill Co.....              | Grafton          |
| J. W. Feather.....                 | Kingwood         |
| R. P. Floyd & Son.....             | Mannington       |
| F. J. Fesler.....                  | Philippi         |
| J. M. Graham.....                  | Kingwood         |

|                                      |                  |
|--------------------------------------|------------------|
| G. T. Hodges.....                    | Shepherdstown    |
| G. W. Harvey.....                    | Tunnelton        |
| Henshaw & Licklider.....             | Martinsburg      |
| James Hawker .....                   | Mannington       |
| J. L. Hall.....                      | Fairmount        |
| J. W. Hedrick.....                   | Alderson         |
| J. M. Hagerty.....                   | Farmington       |
| H. J. Heck.....                      | Barrickville     |
| ———— Herring .....                   | Kingwood         |
| R. Hunter .....                      | Berkeley Springs |
| A. E. Huddleston.....                | White Sulphur    |
| Harry Johnson .....                  | Clarksburg       |
| Johnson & Gwinn.....                 | Alderson         |
| R. A. Johnson.....                   | Parkersburg      |
| R. T. Lowndes.....                   | Clarksburg       |
| J. W. Loughery.....                  | Rowlesburg       |
| Lewisburg Milling & Electric Co..... | Lewisburg        |
| L. P. Licklider.....                 | Martinsburg      |
| W. N. Lemon.....                     | Shepherdstown    |
| Lake & McCarty.....                  | Jane Lew         |
| Lazear Brothers.....                 | Sistersville     |
| Mason & Watson.....                  | Kingwood         |
| C. W. Mayer, Son & Co.....           | Terra Alta       |
| McKown & Busey.....                  | Martinsburg      |
| J. W. and Jeff Miller.....           | Spencer          |
| J. M. McIntosh & Son.....            | Ravenswood       |
| J. M. Miller & Bro.....              | Ronceverte       |
| J. H. Miller & Son.....              | Martinsburg      |
| Mossman Brothers.....                | Huntington       |
| E. W. McNeer.....                    | Lowell           |
| Walter Marshall .....                | Wheeling         |
| Offutt & Kakin.....                  | Terra Alta       |
| Payne Brothers .....                 | Seebert          |
| C. Phillips .....                    | Belington        |
| J. H. Phillips' Sons.....            | Berkeley Springs |

|                               |                  |
|-------------------------------|------------------|
| Pullman Hardware Company..... | Pullman          |
| G. B. Roby.....               | Keyser           |
| A. P. Russell & Co.....       | Buckhannon       |
| W. S. Stout.....              | Harrisville      |
| W. F. Still.....              | Pennsboro        |
| B. T. Stone.....              | Tunnelon         |
| C. W. Siever.....             | Keyser           |
| Sencindiver & Stewart, .....  | Martinsburg      |
| Shanklin Brothers .....       | Lowell           |
| Shaffer & Brown.....          | Kingwood         |
| Spencer Milling Company.....  | Spencer          |
| S. J. Tailor.....             | Toll Gate        |
| A. R. Unger.....              | Berkeley Springs |
| E. F. Wardsworth.....         | Ashley           |
| Washington & Alexander.....   | Charles Town     |
| J. L. Woodyard.....           | Pruntytown       |
| L. P. Wills.....              | Ansted           |
| Williamson & Varner.....      | St. Marys        |
| W. B. Wright.....             | Lawford          |

# AN ACT

## Concerning Commercial Fertilizers, State of West Virginia.

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AN ACT concerning commercial fertilizers, and repealing chapter seventy-two of the Acts of the Legislature of West Virginia, of eighteen hundred and ninety-one.

[Passed February 2d, 1901.]

Be it enacted by the Legislature of West Virginia:

1. Every person who shall sell, offer or expose for sale, or have in his possession with intent to sell in this State, any commercial fertilizer or manure, shall affix conspicuously to every package thereof a plainly printed statement, clearly and truly certifying the number of net pounds of fertilizer in a package, the name, brand or trade-mark under which the fertilizer is sold, the name and address of the manufacturer, the place of manufacture, and stating the percentage of nitrogen or its equivalent in ammonia; of potash, soluble in distilled water; and of phosphoric acid in available form, soluble in distilled water, reverted, as well as the total phosphoric acid, and the materials from which said constituents are derived. In the case of those fertilizers which consist of other cheaper materials, said labels shall give a correct general statement of the composition and ingredients of the elements relied upon, contained in the fertilizer which it accompanies.

2. Before any commercial fertilizer is sold, offered or ex-

posed for sale in this State, the manufacturer, importer or party who causes it to be sold, exposed or offered for sale, shall file with the Director of the West Virginia Agricultural Experiment Station, under oath, the statement required to be affixed under section one of this act.

Provided, That when the manufacturer of any brand of fertilizer or manure shall file said sworn statement no agent or dealer shall be required to file such statement. The making of any affidavit required by this chapter falsely shall be perjury.

3. The manufacturer, importer, agent or seller of any brand of commercial fertilizer or material used for manurial purposes, shall pay for each brand at the time he files a sworn statement required by section two of this act a registration fee of one dollar per annum.

4. The registration fee required to be paid by section three of this act, shall be paid to the treasurer of the West Virginia University for the use of the Agricultural Experiment Station, and the party making such payment shall take from the said treasurer triplicate receipts therefor, one of which he shall retain, and the others shall be deposited, one with the Director of the Agricultural Experiment Station, and the other with the secretary of the Board of Regents, and by them filed and preserved in their respective offices.

5. Immediately after the filing of the receipts aforesaid, with the Director of the Agricultural Experiment Station, said Director shall issue a certificate to the party making such payment, stating the amount of fees paid, and the name, brand or trade-mark under which the fertilizer is sold, the name and address of the manufacturer or importer, the place of manufacture, and that the applicant for said certificate is authorized to sell said fertilizer within the State of West Virginia for the period of one year from the first day of January to the thirty-first day of December, inclusive. Said certificates may be issued at any time for and during the current year, and may be issued

during the month of December for the year commencing on the first day of January thereafter.

6. It shall be the duty of the Director of the West Virginia Agricultural Experiment Station to print or cause to be printed a label or tag setting forth the sworn statement required in section two of this act. The Director shall furnish such labels or tags in quantities in one hundred or multiples thereof, to any person complying with the requirements of this act, and desiring to sell, offer or expose for sale any commercial fertilizer in this State, and shall receive pay therefor at the rate of forty cents for such number of labels or tags as may be required to be affixed to one ton of fertilizer, and shall without delay, pay the same to the treasurer of the West Virginia University, for use of the Agricultural Experiment Station, and take duplicate receipts therefor, one of which he shall retain, and the other he shall deliver to the secretary of the Board of Regents, who shall file and preserve the same in his office.

7. The Board of Regents of the West Virginia University shall expend the money received under the provision of this act in meeting the legitimate expenses of the Station in making analyses of fertilizers, in experimental tests of same, and in such other experimental work and purchases as shall inure to the benefit of the farmers of this State, and shall include in their annual report a statement of the receipts and disbursements thereof.

8. It shall be the duty of the Director of the said Experiment Station, in person or by deputy, to take samples for analysis from any lot or packages of any fertilizer or manure which may be in the possession of any dealer in the State, and he is hereby authorized to prescribe and enforce such rules and regulations as he may deem necessary to carry fully into effect the true intent and meaning of this act; and any agriculturist, purchaser of any fertilizer or manure in this State may take a sample of the same under the rules and regulations of the Director of the said Experiment Station and forward the same to him an-



alysis, and if the Director has reason to believe that the manufacture of, or dealer in, such fertilizer or manure has made any false or fraudulent representations in regard to said fertilizer or manure, he shall cause the said sample to be analyzed free of charge, and certify the same to the person forwarding the sample. And it shall be the duty of every agent or dealer in fertilizers or manures, within the meaning of this act, in this State, when ordering consignments thereof, to promptly notify the Director of the said Experiment Station of the amount ordered, and the place and approximate time of delivery of said fertilizers and manures.

9. Said Director shall also publish by bulletin, the brand, name and location of the manufacturer and chemical analysis of every fertilizer or manure analyzed or caused to be analyzed by him. Said last publication to be made, if practicable, before the time at which said fertilizer is to be applied to the soil.

10. Any manufacturer or vendor of any fertilizer or manure who shall sell or offer or expose for sale any fertilizer or manure without having previously complied with the provisions of this act as hereinbefore set forth, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than fifty nor more than five hundred dollars.

11. Any company, firm or corporation who shall wilfully remove from or deface or change any label, or tag, or brand affixed to any package of fertilizer under the provisions of this act before such fertilizer has been used for manurial purposes, or who shall sell such fertilizer without such label or tag being affixed thereto at the time of the sale, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not less than ten nor more than fifty dollars for each offense.

12. Any company, firm or person who shall remove from or cause to be removed from any package of commercial fertilizer or manure any statement, label or tag affixed thereto under the provisions of this act, and affix or cause the same to be affixed to any other package of commercial fertilizer or manure, shall

be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than ten nor more than fifty dollars for each offense.

13. Any company, firm or person violating any of the provisions of this act, or who fails to comply with any of the requirements of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall, when no other penalty is prescribed, be fined not less than ten nor more than one hundred dollars for each offense. But this act shall not be construed to apply to any one who manufactures fertilizers for his own use and not for sale.

14. The Director of said Experiment Station shall report to the prosecuting attorney of the county where the offense was committed all violations of the provisions of this act, and failure to comply therewith, and a copy of any label, statement or tag required to be filed with said Director or prepared by him, and any analysis made or caused to be made by him, when duly certified by said Director, shall be received in evidence in any prosecution or suit for any violation of the provisions of this act.

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I, Harry Shaw, Clerk of the House of Delegates of West Virginia, hereby certify that the paper hereto annexed is a true copy of an Act of the Legislature of West Virginia passed on the second day of February, 1901, and approved by the Governor on the ninth day of February, 1901; and that the same takes effect ninety days from the date of its passage.

Given under my hand this March 20th, 1901.

HARRY SHAW,  
Clerk of the House of Delegates.



